Abstracts of Dissertations

June 2020 Exit Assessment Exercise

A NOVEL CRT IMPLANTATION METHOD UNDER ELECTROCARDIOGRAPHIC IMAGING GUIDANCE WITH PHYSIOLOGICAL PACING OPTIONS FOR BETTER RESYNCHRONIZATION IN NON-LBBB PATIENTS – A PILOT STUDY

Dr Au Chi Kin, Department of Medicine & Therapeutics, Prince of Wales Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background The response rate of CRT in non-LBBB patients is low.

Objectives A novel Electrocardiographic Imaging (ECGi) guided CRT implantation method was studied in non-LBBB patients.

Methods Non-LBBB CRT candidates were recruited. During CRT implant, RV, coronary sinus, HIS and left-bundle leads were inserted. Non-invasive CardioInsight ECGi mapping system would then be activated to measure the total activation time (TAT) of the heart during different pacing combinations, AV and VV delay. The combination that resulted in the shortest TAT would be chosen as the final setting. ECG, echocardiographic and clinical parameters were measured at baseline and after 3-6 months. Clinical response was defined as improvement in NYHA ≥ 1 class. Echo response was defined as reduction of LVESV ≥ 15%.

Results Total 12 patients were recruited (RBBB = 8; IVCD =4). HIS-Bundle pacing and Left-Bundle pacing were involved in the final settings in 8 patients (4 for each). After implant, QRSd reduced from 165ms±20ms to 135ms±20ms ($p=0.001$). LVEF improved from 25.2%±6.6% to 32.4%±10.3% ($p=0.009$) and LVESV improved from 137mL±58mL to 121mL±52mL ($p=0.04$). NYHA class improved from 3.1±0.5 to 2.0±0.6 ($p<0.0001$). Seven (58%) patients were echo responders and nine (75%) were clinical responders. One patient died of decompensated heart failure at 1-month, and one had CIED infection at 3-month requiring device removal. Current approach resulted in better electrical resynchronization when compared with the conventional CRT (TAT reduction by current approach vs conventional CRT; 41% vs 16%; $p<0.0001$).

Conclusion ECGi guided CRT implantation is feasible and may associate with better clinical outcomes.

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CLINICAL CHARACTERISTIC AND OUTCOMES OF OCTOGENARIANS WITH PERCUTANEOUS CORONARY INTERVENTION PERFORMED: A SINGLE CENTER RETROSPECTIVE REVIEW

Dr Chow Nga Lai, Department of Medicine & Geriatrics, Kwong Wah Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Introduction Octogenarians have a higher incidence rate of ischaemic heart disease than the younger generation and they are always characterised as frail with multiple comorbidities. Majority of cardiologists believe that octogenarians would have more complex coronary artery disease and expect them to have poorer outcome after percutaneous coronary intervention (PCI). However, octogenarian is a heterogeneous group and age alone might not be a good predictor of outcome.

Objective This dissertation aims to review the clinical characteristics and outcomes of all patients admitted for PCI at a local hospital in Hong Kong from year 2016 to 2018. We sought to identify possible adverse factors leading to poor clinical outcomes in the immediate inhospital

period, 30-day and 12-month follow up. We also specifically investigated into the octogenarian group for possible independent predictors towards major adverse cardiac and cerebrovascular events (MACCE) and death.

Method We retrospectively reviewed the clinical notes of 1230 patients who underwent PCI at Kwong Wah Hospital from 1st January 2016 to 31st December 2018. Among those patients, 1125 (91.5%) aged < 80 years old while 105 (8.5%) aged ≥80 years old. Outcome measures included all-cause mortality, myocardial infarction, target vessel revascularization, stroke, wound complications and acute kidney injury at hospitalization, 30-day and 12-month post discharge.

Results A total of 105 octogenarians were treated with PCI from 2016 to 2018. The mean age was 83.4 +/- 2.9 years old with male predominance (64.9%). They had more comorbidities than the younger generation, especially hypertension (68.6% vs 59.8%, p=0.02), cerebrovascular accident (14.3% vs 6.8%, p=0.003), atrial fibrillation (22.9% vs 6.8%, p<0.001) and peripheral vascular disease (10.5% vs 3.0%, p=<0.001). Angiographically, octogenarians had more left main stem disease (10% vs 5.8%, p=0.008). They had a longer length of stay (mean 9.1 days vs 5.1 days, p<0.001) with a higher in-hospital mortality rate (5.7% vs 1.4%, p=0.001). The incidence of cerebrovascular events was also higher (2.7% vs 0.3%, p=0.038 at in-hospital period and 2.7% vs 0.3%, p=0.045 at 12-months follow up). For the regression analysis between the octogenarians and younger cohort, age more than 80 years old was the single independent predictor for in-hospital mortality (OR 4.3, 95% CI 1.5-12.4, p=0.006). For the analysis at 12-months follow up, patients with diabetes mellitus (OR 2.9, 95% CI 1.1-8.0, p=0.038) and chronic kidney disease (OR 12.5. 95% CI 5.0-31.5, p=<0.001) showed a significantly higher mortality rate, while older age was not a significant predictor of mortality. For the subgroup analysis among the octogenarians, cardiogenic shock (OR 25, 95% CI 2.2- 295.3, p=0.010) and type B2 or C lesions (OR 15.0, 95% CI 1.1-198.4) were independent predictors for overall MACCE. Older age (OR 1.61, 95% Cl 1.1-2.5, p=0.026) and cardiogenic shock (OR 13.4, 95% CI 1.0-183.7, p=0.048) were independent predictors for overall mortality among octogenarians.

Conclusion Octogenarians have higher in-hospital mortality but similar survival benefit at 12 months after PCI. Still, among the octogenarian group, older age was one of the adverse predictors of outcome, together with the presence of cardiogenic shock at presentation and complex coronary lesions. Although octogenarians generally have higher procedural risks and inpatient mortality, those with few comorbidities can have comparable long-term survival benefits after PCI when compared to the younger patients.

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INTRACORONARY IMAGING IN PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Dr Ho Cheuk Bong, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background Intracoronary imaging during percutaneous coronary intervention (PCI) allows better delineation of lesion characteristics, more accurate vessel sizing and optimization of stenting results compared with angiogram alone. However, the benefit and safety of its use in primary percutaneous coronary intervention (PPCI) is uncertain.

Objective To determine whether the use of intracoronary imaging with intravascular ultrasound (IVUS) or optical coherence tomography (OCT)/ optical frequency domain imaging (OFDI) in PPCI is associated with better outcomes.

Method From Jan 2014 to Dec 2018, all consecutive patients with PPCI done in Queen Elizabeth Hospital, Hong Kong were retrospectively studied. Baseline and procedural characteristics of angiographic-guided versus imaging-guided PCI were analyzed. Primary endpoint was target vessel failure, and procedural outcomes were contrast volume, number of stents implanted, mean stent length and diameter and use of post-dilatation. Safety outcomes were post-operative acute kidney injury (AKI), need for renal replacement therapy (RRT) and occurrence of no/ slow reflow.

Results A total of 408 patients were included, of which 223 (54.7%) used IVUS or OCT/OFDI during the procedure. Intra-coronary imaging was associated with less target vessel failure during a median follow up of 22 months (Hazard ratio (HR): 0.59; 95% Confidence interval (CI): 0.36-0.97; p=0.036). Patients who had intra-coronary imaging during PPCI received more post-dilatation (77.1% vs 55.1%; p<0.001), had longer (53mm vs 42mm; p<0.001) and more stents (2 vs 1.67; p=0.003) implanted but had more contrast injected (151.2ml vs 130.6ml; p=0.002). There was no statistically significant difference in mean stent diameter or safety outcomes between both groups.

Conclusion Use of intra-coronary imaging during PPCI was associated with less target vessel failure, longer and more stents implanted and more frequent use of post-dilatation. Further prospective randomized controlled trial is suggested to confirm this benefit.

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CARDIOVASCULAR SAFE TY OF NOVEL ORAL ANTICOAGULANTS AMONG PATIENTS WITH ATRIAL FIBRILLATION

Dr Hung Yik Ching, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background Novel oral anticoagulants (NOACs) are effective in reducing risk of thromboembolic stroke among high risk patients with atrial fibrillation.Evidence showed that NOACs, especially dabigatran, might be associated with higher risk of myocardial infarction. It is not known whether the available NOACsare different in terms of cardiovascular safety profile.

Objectives The study sought to compare threeof the commercially availableNOACs (dabigatran, rivaroxaban and apixaban) in terms ofrisk of myocardial infarction and sudden cardiac death. Therisk of combined MACE (major adverse cardiovascular outcomes) (including myocardial infarction, ischemic or haemorrhagic stroke, hospitalization for congestive heart failure and cardiovascular death), myocardial infarction, cardiovascular death, hospitalization for heart failure, strokeand fatal bleedingwere also of interest.

Methods Using adatabase of Hospital Authority of Hong Kong, 1161patients with nonvalvular atrial fibrillation taking NOACs(dabigatran, rivaroxaban and apixaban) before 31stDecember, 2017 were identified. Fourcohorts were set up for comparison and inverse probability of treatment weighting was used to balance the patients' baseline characteristics. Cox proportional hazard regression analyses wereperformed among the weighted population to compare the three NOACsanddirect thrombin inhibitor versus factor Xa inhibitors.

Results Rivaroxaban, apixaban andrivaroxaban plus apixaban were associated with trend of lower incidenceof combined primary endpointof myocardial infarction plus sudden death compared todabigatran (HR0.72, 0.58 and 0.67 respectively). There were no statistically significant differences between rivaroxaban and apixaban.

Conclusion Intra-NOACsdifferences may exist in terms of cardiovascular safety profileamong patients with atrial fibrillation.

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THE EFFECT OF SYMPTOM-TO-BALLOON TIME ON CLINICAL OUTCOMES IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Dr Lai Tsun Kwong, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background Door-to-balloon time is a well-recognised performance measure in the setting of ST-Elevation Myocardial Infarction (STEMI) and has been adopted in international guidelines. However, it may represent only a fraction of the total ischaemic time as myocardial ischaemia starts at the onset of symptoms. There have been conflicting results in previous studies regarding the significance of symptom-to-balloon time with clinical outcomes and local data is scarce.

Method Consecutive patients who underwent primary percutaneous coronary intervention (PPCI) for STEMI from 1st January 2010 to 31st December 2018 at Pamela Youde Nethersole Eastern Hospital were identified retrospectively. Patients were categorized into two groups according to a symptom-to-balloon time cut-off of 240 minutes. The primary endpoint was defined as the composite outcome of all-cause mortality and MACCE (Cardiovascular death, non-fatal MI, non-fatal stroke and target vessel revascularisation) and the secondary endpoints were the individual components of the primary composite endpoint.

Results 498 patients presented with STEMI who underwent PPCI. 135 patients were excluded due to different reasons, including 99 patients who had missing data for symptomto-

balloon time. A total of 363 patients were included and 161 patients (44%) had symptomto-balloon time of more than 240 minutes. Comparing to those who had symptom-toballoon time of less than or equal to 240 minutes, they were more likely to be female and diabetic. They also had a significantly longer door-to-balloon time (93 vs 75 minutes, p = <0.001). Regarding 30-day and long-term clinical outcomes up to 5 years, there were no significant differences found between the two groups according to symptom-to-balloon time (30-day composite outcome: odds ratio: 1.036, 95% CI 0.571-1.878, p=0.908; long-term composite outcome: hazard ratio: 1.202, 95% CI 0.855-1.691, p=0.275).

Conclusion There was no significant association between symptom-to-balloon time and 30- day or long-term primary composite outcome of all-cause mortality and MACCE up to 5 years in patients with STEMI undergoing PPCI.

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FEATURE TRACKING BY CARDIOVASCULAR MAGNETIC RESONANCE IMAGING FOR ASSESSMENT OF HEART FAILURE WITH PRESERVED EJECTION FRACTION

Dr Lee Ka Chun Kevin, Department of Medicine & Geriatrics, Ruttonjee Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background Heart failure with preserved ejection fraction (HFpEF) (left ventricular ejection fraction ≥ 50% as per the European Society of Cardiology [ESC] 2016 heart failure guidelines) is an increasingly important health issue of this era. Echocardiography has been the main imaging modality used to diagnose HFpEF, but it is limited by echogenicity and potential errors in the quantification of heart chamber volumes and mass. On the other hand, traditional Cardiovascular Magnetic Resonance (CMR) methods of assessing LV diastolic dysfunction like tagged strain imaging and phase contrast imaging are limited by the long scanning and post-processing time due to the extra CMR image sequences required. Assessment of myocardial strain by a relatively novel technique, CMR Feature Tracking (CMR-FT), which is not bound by these limitations, is a potential alternative imaging modality to identify HFpEF.

Objectives 1) To determine whether myocardial strain parameters derived from CMR-FT are reliable markers to identify HFpEF.
2) To determine the CMR cut-off values of left atrial volume index (LAVI) and left ventricular mass index (LVMI) for HFpEF.

Methods Patients with heart failure (HF) symptoms and healthy subjects were prospectively recruited. They underwent echocardiography, CMR imaging and N-terminal pro-B-type natriuretic peptide (NT-proBNP) testing within 24 hours. The HF subjects were subsequently categorized into the HFpEF group if they fulfilled both the echocardiographic *and* NT-proBNP criteria for HFpEF as specified in the ESC 2016 HF guidelines. Otherwise, they were categorized into the indeterminate group. Together with the healthy subjects, 3 groups in total (HFpEF, indeterminate and healthy) were made up. Offline FT strain analysis was performed on the CMR images to determine if there was any significant difference of the strain parameters among the 3 groups. Accuracy of the strain parameters in differentiating HFpEF was determined by the area under the receiver operator characteristic (ROC) curves with cut-off values established for HFpEF. Accuracies of CMR LAVI and LVMI in differentiating HFpEF were determined by the area under the ROC curves with cut-off values established.

Results 71 subjects were recruited into the study. 13 of them were excluded for various reasons. 58 subjects (42 HF and 16 healthy) remained. The 42 HF subjects were classified into either HFpEF (23 subjects) or indeterminate (19 subjects) based on the criteria described above. The mean left ventricular (LV) early peak circumferential diastolic strain rate (DSR) ($p = 0.004$) and radial DSR ($p = 0.03$) were the lowest in the HFpEF group, followed by the indeterminate and healthy groups respectively. The optimal cut-off values of the circumferential and radial DSR's for HFpEF were found to be 0.71s-1 (AUC 0.76) and 1.34s-1 (AUC 0.74) respectively. The LV longitudinal and right ventricular strain parameters did not show any statistically significant difference across the groups. The optimal CMR cut-offs of LAVI and LVMI for HFpEF were found to be 47.6 mL/m2 (AUC 0.84) and 44.5 g/m2 (AUC 0.74) respectively.

Conclusions The LV short axis (i.e. circumferential and radial) DSR's derived from CMR-FT imaging are potentially promising parameters to identify HFpEF. They can be rapidly determined as no extra CMR image sequences are required and the same contours used for LVEF and volume quantification can be utilised. Further studies are required to determine if this finding can be replicated on other CMR-FT software vendors and Magnetic Resonance scanner models, whether the LV short axis DSR's can grade LV diastolic dysfunction severity and to establish the age- and gender-specific cut-offs for HFpEF.
CMR cut-off values of LAVI and LVMI for HFpEF were determined. Further studies with larger sample sizes are needed to establish the gender-specific cut-offs, especially for LVMI.

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IMPACT OF LEFT VENTRICULAR SYSTOLIC DYSFUNCTION ON OUTCOMES IN PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION: EXPERIENCE FROM A REGIONAL HOSPITAL

Dr Li Andrew Vincent, Department of Medicine & Geriatrics, Kwong Wah Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background Heart failure (HF) is a common disease with coronary artery disease being the leading cause of heart failure. Coronary revascularization have been shown to improve outcomes in patients with heart failure of ischemic aetiology. Previous studies have demonstrated worse outcomes in patients with congestive heart failure and LV systolic dysfunction undergoing PCI. However, with the advancement of therapies and new pharmacological agents for heart failure, outcomes may be different. The aim of the study is to investigate the impact of impaired EF on major adverse cardiac events (MACE) and all cause mortality after PCI at 2 years. The independent predictors of MACE and death and also utilization of guideline directed medical therapy (GDMT) in patients undergoing PCI will also to analyzed.

Methods All consecutive PCI cases performed between 2015-2017 at Kwong Wah Hospital who has had ejection fraction measured by echocardiogram or other means within 12 months prior to index PCI were included. Patients without EF measurement prior to PCI were excluded. Subjects were categorized into 2 groups based on EF. LV systolic dysfunction was defined as EF≤35% and those with EF>35% were defined as the control group. Their demographics, clinical characteristics, procedural and angiographic characteristics and clinical outcomes were reviewed and analyzed. The primary outcome was MACE at 2 years. Secondary

outcome was all-cause mortality at 2 years. Multivariate Cox proportional-hazards regression was used to analyze variables that are associated with MACE and mortality at 2 years after adjustment for relevant clinical and co-morbid variables.

Results A total of 783 subjects were included in the analysis, with 78 patients had EF≤35% and 705 patients have EF>35%. Patients with EF ≤35% have significantly worse early and late outcomes compared those with EF>35%. Early (28 day) and late (2 year) MACE (28 day: 14.3% vs 2.8%, p<0.01; 2 year: 41.1% vs 16.1%, p<0.01) and mortality (28 day: 10.4% vs 1.7%, p<0.01; 2 year: 20.5% vs 6.2%, p<0.01) were significantly higher in patients with EF ≤35% compared to EF>35%. The rate of HF re-admissions (28 day: 3.9% vs 0.3%, p<0.01, 2 year: 12.3% vs 4%, p<0.01) was significantly higher in subjects with EF ≤35%. Complete revascularization was achieved in 88.5% of patients with EF≤35% and 95.2% in the control group. Multivariate analysis found that EF≤35% was a significant independent predictor of MACE at 2 years together with age, triple vessel disease, emergency procedure and renal impairment. Independent predictors of mortality at 2 years included EF ≤35%, emergency procedure, renal impairment, insulin dependent diabetes and presentation with New York Heart Association (NYHA) class III/IV symptoms. Analysis of medication usage showed that angiotensin-converting enzyme inhibitors (ACEi), diuretics, anticoagulation, aldosterone-antagonist and digoxin were more commonly prescribed on discharge in patients with EF≤35%.

Conclusion In conclusion, we have demonstrated that in patients revascularized by PCI, LVEF remains a powerful predictor of adverse outcomes, with patients with EF≤35% being associated with increased MACE and mortality at 2 years. Furthermore, our data showed that complete revascularization can be achieved in a high proportion of patients with impaired EF with low rates of recurrent MI and unplanned revascularization. Thus, revascularization by PCI can still be a beneficial treatment option in patients with EF≤35%, though further studies are needed to determine the subgroup of patients who will derive the most benefit from PCI. Finally, given the relationship between LVEF and outcomes after PCI, EF assessment prior to PCI should be performed where possible to allow risk stratification and commencement of guideline directed medical therapy and other treatment to further improve outcomes in patients with EF≤35%.

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HEMODYNAMIC PROFILE OF LUNG TRANSPLANT CANDIDATES IN HONG KONG

Dr Ling Wood-Hay Ian, Department of Medicine, Grantham Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Abstract On average, 12 lung transplantations were performed each year in Hong Kong. Patient selection is an integral component of any transplant program due to the limited donor resource. Hemodynamic data not only helps to assess transplant candidacy, they also inform program directors on evolving disease epidemiology and outcome prediction. We describe the hemodynamic data of patients referred to our lung transplant program. This cohort consists of 98 patients who received cardiac catheterization from 2014 to 2018. The majority had underlying lung diseases (60%), followed by pulmonary arterial hypertension (PAH) (16%) and congenital heart disease (16%). The data was analyzed based on the World Health Organization (WHO) pulmonary hypertension groups. Mean pulmonary arterial pressure (mPAP), pulmonary vascular resistance (PVR) and cardiac index (CI) were significantly different between group 1, 3 and 4 (p-value range < 0.001 to 0.01). Comparing the PAH (group1) to respiratory patients (group 3), mPAP and PVR were significantly higher in PAH (54 vs. 30 mmHg; p <0.001, 13 vs. 4 Wu; p < 0.001), where else, CI was lower in PAH (2.51 vs. 3.01 L/min/m2; p = 0.02). Cut-off at mPAP ≥34 mmHg appeared to be an optimal cut-off to differentiate group 1 from group 3 patients. We had more PAH patients in our cohort than that seen in international registries. Local data on PAH epidemiology will help predict future transplant burdens in Hong Kong.

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MORTALITY BENEFIT OF PRIMARY PREVENTION OF IMPLANTABLE CARDIOVERTER DEFIBRILLATORS IN HEART FAILURE

Dr So Tai Chung, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background Implantable cardioverter defibrillators (ICD) can prevent sudden cardiac death. According guideline, it is an indication for patients with poor LVEF and NYHA II-III to receive ICD as primary prevention. However, not all patients benefit equally from ICD. Improving risk stratification and prognostication is therefore important to identify suitable candidates for ICD. The risk model - Seattle Heart Failure and Proportional Risk Models (SPRM) predict proportional risk of sudden cardiac death in heart failure patients and may help to predict ICD benefit in primary prevention.

Objective To evaluate the benefit of ICD for primary prevention and interaction with SPRM.

Method This is a retrospective study from 2007 to 2018. Patients with ICD/ CRT-D implanted were included as intervention group, control group was patients received medical treatment without device implantation. Survival analysis was done with Kaplan Meier method and Cox proportional hazard model.

Result ICD showed an all-cause mortality benefit compared to medical treatment group ($p=0.003$*) with hazard ratio 0.67 ($p=0.004$*). Subgroup analysis showed all-cause mortality benefit in ischemic subgroup ($p=0.011$*) and NYHA II patient ($p=0.014$). Further analysis with SRPM subgroups, there was mortality benefit in the subgroup of SPRM > median (median =47%) ($p<0.001$*).

Conclusion In primary prevention, ICD had mortality benefit in ischemic cardiomyopathy and NYHA II, there was no mortality benefit for ICD in non-ischemic cardiomyopathy. SPRM can identify patients with no ICD benefit and patients with maximal ICD benefit.

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STRATEGY IN MANAGEMENT OF HEAVILY CALCIFIED CORONARY VESSELS - A CASE-SERIES OF THE USE OF SHOCKWAVE CORONARY INTRAVASCULAR LITHOTRIPSY

Dr Yu Chi Kit, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Cardiology Exit Assessment Exercise)

Background The presence of calcium in the coronary artery affects the outcome of percutaneous coronary intervention (PCI). One of the latest technologies is Shockwave coronary intravascular coronary lithotripsy (IVL) in which sonic pressure is emitted to crack the calcium in the coronary artery.

Method This was a retrospective, multicenter case series which investigated patients who received IVL. Their baseline clinical characteristics, lesion characteristics, procedure details and outcomes were analysed. The clinical outcomes during the index hospitalization and at 3 month were analysed. Potential challenges of IVL as well the pros and cons of other techniques for tackling calcified lesions were discussed.

Results 44 patients and 67 lesions were analysed. The average length of lesion was 31.7 ± 8.40 mm and the average stenosis percentage was 79.4 ± 13.4%. 77.6% of lesions were Type C lesions and 82.1% were severely calcified lesions.

Success in stent delivery and IVL deployment occurred in 97.7% of patients. There were no coronary artery perforation, slow flow, closure or cardiac death during the index hospitalization. MACE occurred in 2.3% of patients within the index hospitalization. For the 3-month safety outcome, myocardial infarction and cardiac death occurred in 2.3% of patients and MACE occurred in 4.5% of patients.

Conclusion In this retrospective case-series, Shockwave IVL was able to demonstrate high procedural success rate with a low rate of complication. However, more data are needed to compare the safety and clinical outcomes of IVL with other therapies.

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MACHINE LEARNING–BASED MODEL FOR OUTCOME PREDICTION IN INTENSIVE CARE UNITS

Dr Fong Ka Man, Department of ICU, Queen Elizabeth Hospital (Jun 2020 Critical Care Medicine Exit Assessment Exercise)

Background Researchers have long been struggling to improve the disease severity score in mortality prediction in ICU. The digitalization of medical health records and advancement of computation power have promoted the use of machine learning in critical care. This study aimed to evaluate whether machine learning model would outperform traditional APACHE IV, in predicting hospital mortality of patients admitted to ICU, without the need of adding extra variables in the prediction procedure.

Method The datasets were assembled from the eICU database including 139369 patients across 208 hospitals throughout the U.S. and 5 ICUs in Hong Kong, including 10909 patients. The two datasets were first combined into one large dataset before 80:20 stratified split into the training set and the test set. The XGBoost machine algorithm was chosen to predict the hospital mortality. The variables in the model were the same as those included in the APACHE IV score. The discrimination and calibration of the model were assessed.

Results Of the 147054 patients in the whole cohort, the hospital mortality was 9.3%. The area under the precision-recall curve for the XGBoost algorithm was 0.57, and 0.48 for APACHE IV. Similarly, the XGBoost reached an area under the receiving operating curve (AUROC) of 0.90, while APACHE IV had an AUROC of 0.87. Additionally, the XGBoost algorithm showed better calibration than the APACHE IV.

Conclusions Using the same variables as in APACHE IV, the XGBoost algorithm outperformed the APACHE IV in predicting hospital mortality for patients admitted to ICU, based on the eICU and Hong Kong datasets.

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CENTRAL TO ARTERIAL CARBON DIOXIDE CONCENTRATION DIFFERENCE IN EARLY RESUSCITATION OF SEPTIC SHOCK –PROSPECTIVE OBSERVATIONAL STUDY WITH HONG KONG ICU PATIENTS

Dr Ma Hei Yee, Department of ICU, Kwong Wah Hospital (Jun 2020 Critical Care Medicine Exit Assessment Exercise)

Background Septic shock is a major cause of high mortality in ICU patients. One of the ways to monitor response to septic shock resuscitation is by measuring serum lactate, as it is known that lactate change is closely related to clinical outcomes in cases of septic shock. Several studies showed that the CO2 gap in septic shock plays a role in monitoring response to resuscitation.

Objective The objective of this study is to investigate that a normal CO2 gap 6 hours after diagnosis and resuscitation of septic shock for ICU patients was associated with a more significant decrease in lactate, as well as a superior outcome namely change in SOFA score and 28-day mortality.

Design This is a prospective observational study in a 13-bed Adult Mixed Medical and Surgical ICU in Hong Kong. The primary outcome was the relative difference in serum lactate levels between patients with a normal, and high CO2 gap at 6 hours after resuscitation. The secondary outcomes were the difference in SOFA score in between the first 24 hours after ICU admission and mortality at 28 days between patients with normal CO2 gap and high CO2 gap at 6 hours after resuscitation. The subgroup analysis was comparing the relative lactate changes in patients with normal ScvO2 at 6 hours after resuscitation with 1) normal CO2 gap and 2) high CO2 gap 6 hours after resuscitation.

Result 79 patients who were admitted to ICU for septic shock, as defined by Sepsis 3, were recruited. Patients with a normal CO2 gap 6 hours after resuscitation were found to have a more significant lactate decrease compared with patients with a high CO2 gap at 6 hours after resuscitation. The mean relative lactate change in normal CO2 gap at T6 was -23.8 % ± 27.7%, while the mean lactate change in high CO2 gap at T6 was 1.28% ± 41.4%. The mean difference was -25.1 % ± 8.2% (95% CI -41.46% to -8.71%, p value = 0.003). In subgroup analysis, in all patients with a normal ScvO2 at 6 hours after resuscitation, patients with normal CO2 gap 6 hours after resuscitation were found to have more significant lactate decrease compared to patients with a high CO2 gap at 6 hours after resuscitation, with mean difference of -22.9% ± 10.1% (95% CI -43.4% to -2.4%, p = 0.03). For secondary outcomes, patients with normal CO2 gap at 6 hours after resuscitation were associated with a more significant SOFA score decrease when compared to patients with high CO2 gap at 6 hours after resuscitation with mean difference of -16.78% ± 7.8% (95% CI -32.2% to -1.33 %, p = 0.034). 28-day mortality was statistically non-significant between 2 groups.

Conclusion A normal CO2 gap measured after early resuscitation (defined as 6 hours after diagnosis of septic shock) in septic shock patients is associated with higher lactate clearance and greater decrease in SOFA score. A normal CO2 gap and ScvO2 after early resuscitation was associated with a higher lactate clearance when compared to a high CO2 gap and normal ScvO2. Furthermore, in septic shock patients with high lactate but normal ScvO2, CO2 gap may help guiding resuscitation which mainly aim at improving cardiac output to meet patients' metabolic needs. CO2 gap can be a surrogate marker for lactate clearance in monitoring response to resuscitation of patients with septic shock.

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TRABECULAR BONE SCORE: NORMATIVE REFERENCE DATA IN CHINESE MEN AND WOMEN IN HONG KONG AND ITS ABILITY TO PREDICT INCIDENT FRACTURES

Dr Leung Ka Hong Eunice, Department of Medicine, Queen Mary Hospital (Jun 2020 Endocrinology, Diabetes & Metabolism Exit Assessment Exercise)

Background Trabecular bone score (TBS) is an indirect index of bone microarchitecture which predicts incident fractures. We aim to develop a normative reference data for TBS in Hong Kong Chinese and examine the predictive ability of TBS in incident fractures.

Methods TBS data collected from 5343 Chinese men and women enrolled in the Hong Kong Osteoporosis Study were analyzed. Clinical fracture events were identified from Clinical Data Analysis and Reporting System up to 1st January 2019.

Results Normative reference data were derived from 987 and 2542 healthy men and women respectively. There was a linear relationship between age and TBS in both genders. 4313 participants were eligible for analysis of TBS and the risk of major osteoporotic fracture. During a mean follow-up of 14 ± 3 years, 292 subjects (6.8%) sustained a major osteoporotic fracture. Compared with those without incident fracture, these subjects were older and had significantly lower lumbar spine BMD, femoral neck BMD and TBS at baseline. Multivariable Cox regression analysis shows that TBS was an independent risk factor for major osteoporotic fracture. The hazard ratio per SD decline of TBS was 1.37 (95% confidence interval 1.16-1.63, $p< 0.001$) after adjustment for clinical risk factors and femoral neck BMD.

Conclusion TBS is an independent risk factor for major osteoporotic fracture. Further analysis is required to determine whether TBS can improve incident fracture prediction in addition to femoral neck BMD and Fracture Risk Assessment Tool.

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PREVALENCE OF ERECTILE DYSFUNCTION AND THE ASSOCIATED FACTORS AMONG DIABETIC PATIENTS IN A COMMUNITY HOSPITAL IN HONG KONG

Dr Mak Kwan Ping, Department of Medicine & Geriatrics, Our Lady of Maryknoll Hospital (Jun 2020 Endocrinology, Diabetes & Metabolism Exit Assessment Exercise)

Background Erectile dysfunction is a known complication of diabetes mellitus and is often included in the metabolic risk assessment, but often being neglected. The study aims to estimate the prevalence of erectile dysfunction in diabetic patients with a cross-sectional study of diabetic patients in a community hospital, and to identify the associated factors.

Methods 5-item version of the International Index of Erectile Function (IIEF-5) is used as a diagnostic and classification tool of erectile dysfunction. Data are extracted from existing metabolic risk assessment for analysis of possible associated factors. Univariate analysis was performed with Pearson Chi-squared test and multivariate logistic regression was used to simultaneously examined the associated factors, for their association with diagnosis and the severity of erectile dysfunction.

Results The point prevalence of erectile dysfunction was 44.2% (95% CI, 0.395-0.489). Multivariate logistic regression showed that age (OR 1.054; 95% CI 1.026 – 1.082; $p<0.001$) and presence of diabetic retinopathy (OR 1.700; 95% CI 1.032 – 2.801; $p=0.03710$ were associated

with presence of erectile dysfunction. For the severity of erectile dysfunction, it is associated with age (OR 1.133; 95% CI 1.077 – 1.191; p<0.001) and duration of diabetes. (OR 1.069; 95% CI 1.019 – 1.121; p=0.006)

Conclusion Erectile dysfunction was a common condition in diabetic patients. It was associated with other diabetic complication and increasing age. The severity of ED was also associated with increasing age and longer duration of diabetes. Clinicians should manage erectile dysfunction as part of their diabetic care.

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EVALUATION OF THE OPTIMAL THYROXINE LEVELS FOR THYROID HORMONE REPLACEMENT IN PATIENTS WITH CENTRAL HYPOTHYROIDISM

Dr So Hay Man, Department of Medicine & Geriatrics, Kwong Wah Hospital (Jun 2020 Endocrinology, Diabetes & Metabolism Exit Assessment Exercise)

Introduction Central hypothyroidism results from pituitary or hypothalamic dysfunction. The evaluation of the adequacy of thyroxine replacement is difficult, due to the loss of thyrotropin (TSH) as an accurate feedback marker.

Aim To determine the optimal free T4 (fT4) level for thyroxine replacement with a favorable metabolic and clinical profile in central hypothyroidism.

Method This was a single center, prospective open-label crossover-like trial of 51 patients (mean age 56±12.9 years, 27 male) with hypopituitarism with multiple hormonal deficiencies including central hypothyroidism. Dosage of levothyroxine (L-T4) was titrated to a targeted lower, middle and upper fT4 tertile and maintained for 24 weeks before assessment. Anthropometric and physiological measurements, metabolic and peripheral tissue markers, cognitive and quality of life assessments were compared before and after each fT4 tertile change. This was followed by another 24-week cycle of L-T4 dosage adjustment to achieve fT4 in another tertile, with the same assessment as above.

Results We demonstrated that raising fT4 target from lower to upper tertile within the normal reference range resulted in significant decrease in body mass index (27.1±6.0 vs 25.7±5.6 kg/m2, P<0.01), waist circumference (89.5±12.7 vs 86.4±12.1 cm, p<0.01), diastolic blood pressure (79.1±12.9 vs 74.5±12.9 mmHg, p<0.05) and low density lipoprotein cholesterol (3.94±0.88 vs 2.90±0.71 mmol/L, p<0.01). The occurrence of metabolic syndrome (48.2% vs 29.0%, p <0.05) was significantly reduced with increasing fT4 from middle to upper tertile, without significant effect in glycemic indexes.

Conclusion In this study, we demonstrated that raising fT4 target to the upper tertile of normal resulted in a favourable improvement in various metabolic indexes without a significant increase in adverse effects over a period of 48 weeks.

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A REVIEW ON A MODIFIED ADRENAL VENOUS SAMPLING (AVS) PROTOCOL FOR PATIENTS WHO HAVE HISTORY OF ALLERGY AND REQUIRED STEROID COVER FOR IODINATED CONTRAST

Dr Yan Ka Shing Quentin, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (Jun 2020 Endocrinology, Diabetes & Metabolism Exit Assessment Exercise)

Background Adrenal venous sampling (AVS) is the gold standard to determine laterality of primary hyperaldosteronism. However, steroid given as a premedication for those required will make biochemical data uninterpretable. Our hospital designed a modified protocol for this group of patients using Dexamethasone and Tetracosactide, and we have been using it since 2008.

Objective Our primary objective is to assess the accuracy and safety of this modified protocol as compared with non-stimulated protocol in identifying unilateral form of primary hyperaldosteronism by evaluating the clinical (post-operative blood pressure and anti-hypertensives requirement) and biochemical response (potassium level and post-operative aldosterone-renin ratio (ARR)) of these patients after surgery, as well as any adverse events during and after the procedure.

Methodology Patients who underwent AVS in the period of 1/1/2008 to 31/12/2019 in Pamela Youde Nethersole Eastern Hospital (PYNEH) with subsequent unilateral adrenalectomy were reviewed. Total 44 patients were included in this retrospective study. Information of patients were extracted through Clinical Data Analysis and Reporting System (CDARS) of the Hospital Authority of Hong Kong. Statistical analysis used were Statistical Package for the Social Sciences (SPSS) software.

Results The International consensus for outcomes after adrenalectomy for unilateral primary aldosteronism published in 2017 was used to determine the outcomes of all surgical cases included.
For the positive predictive value (PPV) for clinical benefit (partial or complete clinical success), the non-stimulated protocol was up to 96.77%, while the modified protocol was 100%. Both groups achieved normal potassium level after operation. For the available ARR, the PPV for biochemical success for both protocols was 100%. There were no adverse events for all 33 cases of AVS using the modified protocol.

Conclusion Our modified protocol can be a feasible and safe way for patients who have contrast allergy and need to undergo AVS.

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RISK FACTORS OF PEPTIC ULCER REBLEEDING FOLLOWING ENDOSCOPIC HEMOSTASIS AND PROTON PUMP INHIBITOR THERAPY: A SINGLE CENTRE RETROSPECTIVE STUDY

Dr Cheung Chole Kwong Yee, Department of Medicine & Geriatrics, Ruttonjee Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Patients with peptic ulcer bleeding (PUB) are at risk of rebleeding despite endoscopic therapy and use of adjunct high dose intravenous proton pump inhibitor (PPI). As rebleeding is strongly associated with mortality, identification of risk factors of rebleeding may assist in clinical management.

Aim To identify factors predicting recurrent PUB following endoscopic hemostasis and use of post-endoscopy PPI infusion.

Patient and Methods This was a retrospective observational study of all patients admitted to Ruttonjee Hospital from January 2012 to December 2018, who had received initial successful endoscopic hemostasis for PUB and received post-endoscopy high dose PPI infusion for 72 hours. Patients were evaluated for rebleeding episodes within 30 days of initial successful therapeutic endoscopy. Clinical and endoscopic characteristics and outcomes were compared between patients with and without rebleeding. Univariate and multivariate analyses were performed to identify independent predictors of rebleeding.

Results A total of 242 patients were analysed. Rebleeding occurred in 55 cases (22.7%). Median time to rebleeding was 4 days (range 1 to 17 days), with 86% (49/55) of rebleeding occurring within the first 7 days of index endoscopy. All-cause 30-day mortality rate was 8.7%. Five patients with rebleeding required salvage surgery. Multivariate logistic regression analysis revealed that age ≥ 70 (OR 4.43, 95% C.I. 2.02-9.71, $p<0.001$), presence of shock at presentation (OR 2.65, 95% C.I. 1.31-5.36, $p=0.007$), after-hours index endoscopy (OR 2.15, 95% C.I. 1.01-4.59, $p=0.047$), ulcer site at duodenum (OR 2.73, 95% C.I. 1.22-6.11, $p=0.015$), and Forrest Ia ulcers (compared to: Forrest Ib

OR 5.03, 95% C.I. 1.31-19.61; Forrest IIa OR 7.30, 95% C.I. 1.73-30.30; Forrest IIb OR 10.87, 95% C.I. 2.66-45.45; all p <0.05) were independent predictors of peptic ulcer rebleeding.

Conclusion Thirty-day rebleeding rate remained significant despite endoscopic and PPI infusion therapy, with most rebleeding occurring within first 7 days of initial successful endoscopy. Patients of age 70 or above, presence of shock at presentation, after-hours endoscopy, ulcers at duodenum, and Forrest Ia ulcers were independent predictors of peptic ulcer rebleeding.

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BIOLOGICS USE IN PATIENTS WITH CROHN'S DISEASE IN HONG KONG A TERRITORY WIDE REVIEW

Dr Luk Hin Kwan Karen, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Background The incidence of inflammatory bowel disease (IBD) has increased in the last two decades in Hong Kong. Withthe introductionof new classesofbiologic in the Hospital Authority Drug Formulary (HADF), the trend on using biologic has changed significantly. However, data on predictive factors of response to biologics and side effect profile are lacking in Hong Kong.

Method Patients with a confirmed diagnosis of Crohn's disease(CD) from year 1981 to 2016 were identified from a territory-wide Hong Kong IBD registry involving 13 public hospitals. Patients were followed up from the date of starting biologics (infliximab, adalimumab, vedolizumab and ustekinumab) till the end of 2018. Response to biologics wasdefined as patients who remained on therapy and had achieved steroid-free clinical remission at week 52 without any CD-related hospitalizationorsurgerieswithin the 52 weeks after starting biologics.

Results From 2001 to 2018 311 CD patients received biologic s, with t he number increasing from 2 in 2001 to 266 in 2018 . Seventy two patients (utilized 1 biologic and failure to achieve clinical remission w as the commonest reason for switching therapy . Allergic reaction wa s the most frequently encountered side effect (7.9 The overall rate of infection and gastrointestinal malignancy was 8.85% and 0.013% respectively. A total of 164 (53 .2%) of patients achieved response to biolo gic thera py . C oncomitant use of corticosteroids (O dds R atio (OR) 0.180 , confidence interval (CI 0.1 1 0. 3 1 , p <0.001) and number of previous hospital admissions (OR 0.887 , 95% CI 0. 82 0.96 , p 0.001) were associated with non response.

Conclusion Biologic therapy is increasingly used in the treatment regime of CDwith a good safety profile. Patients who were given concomitant steroids and had more hospital admissions prior to starting biologic therapy were less likely to respond.

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REACTIVATION OF HEPATITIS B

Dr Shum Chui Yin, Department of Medicine, Tseung Kwan O Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Hepatitis B is a common cause of chronic liver disease in Hong Kong. Current mainstay treatment is oral nucleoside analogues. However, hepatitis B virus is not eradicated from liver tissue with current nucleoside analogues. Although current guidelines suggest HBsAg seroconversion as a treatment endpoint, concerns including cost, long term safety and patient preference may lead to early stopping of antivirals. Variation in relapse rate has been observed in different studies, ranging from 18 67%.

Aim The aim of the study is to determine the reactivation rate of hepatitis B after stopping antivirals in a real clinical situation and to identify possible predictors for reactivation.

Methods A community hospital based retrospective study was performed. Patients who had been on antiviral treatment and with subsequent discontinuation of therapy were identified using pharmacy databas e during the period 2000 2018.

Results 122 out of 477 patients were included. The median duration for antiviral treatment was 35.5 months (12 126), with a median follow up period of 47 months (12 180). 54 patients (developed clin ical significant hepatitis B flare ups requiring reintroduction of antiviral treatment, and 9.2% needed hospital admission. Majority (of relapse occurred after 1 year of withdrawal of nuleos(t)ide analogue. High baseline HBV DNA level predicted clin ical relapse.

Conclusion Cessation of antiviral treatment resulted in reactivation of hepatic B in almost half of Asian patients and a significant proportion needed hospitalization., Therefore, patients should be advised to continue antiviral treatment l ong term. For patients who chose to discontinue antiviral therapy, careful and close monitoring is essential.

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CLINICAL OUTCOME AND PREDICTORS OF PROGNOSIS IN CIRRHOTIC PATIENTS WITH VARICEAL BLEEDING

Dr Suen To Lam, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Variceal bleeding is a severe complication of cirrhosis with high rebleeding and mortality rates. Different predictive factors of rebleeding and mortality have been reported in Western countries. However, local data of clinical outcomes of variceal bleeding, including rebleeding and mortality, is limited.

Objective The primary objective is to study the outcome of cirrhotic patients hospitalized with variceal bleeding. The secondary objective is to identify predictive factors of rebleeding and mortality.

Methods This is a retrospective study recruiting patients with cirrhosis admitted for variceal bleeding from 1st January 2009 to 31st December 2018 at Pamela Youde Nethersole Eastern Hospital.

Results A total of 155 patients were recruited. The source of bleeding was oesophageal varix in 120 patients and gastric varix in 35 patients during the index endoscopy. The initial endoscopic haemostasis rate was 94.8%. The 5- day rebleeding and 6-week rebleeding were 5.2% and 11.6%, respectively. The in-hospital mortality and 6-week mortality were 22.6% and 27.1%, respectively. The independent factors associated with 6-week rebleeding were presence of splenomegaly (p=0.028) and use of non-selective betablocker (p=0.04) after index bleeding. The independent predictive factors associated with in-hospital mortality were presence of hepatocellular carcinoma (HCC) (p=0.001), development of acute kidney injury (AKI) (p=0.001), Model for end-stage liver disease (MELD) score >18 (p=0.02), need of endotracheal intubation for endoscopy (p=0.03) and hypotension on presentation (p=0.04). The independent factors associated with 6-week mortality were presence of HCC (p=<0.001), development of AKI (p=0.001), MELD score ≥18 (p=0.01) and need of intensive care unit (ICU) admission (p=0.005).

Conclusion Endoscopic therapy was effective for initial haemostasis of variceal bleeding. Splenomegaly and use of NSBB were independent predictive factors associated with 6-week rebleeding. The presence of HCC, AKI, MELD ≥ 18, endotracheal intubation, hypotension and the need for ICU admission were factors predicting in-hospital and 6-week mortality.

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TREATMENT FAILURE AND RECURRENCE OF METRONIDAZOLE AND VANCOMYCIN TREATMENT FOR CLOSTRIDIOIDES DIFFICILE INFECTION AND THEIR ASSOCIATED RISK FACTORS IN A REGIONAL HOSPITAL IN HONG KONG

Dr Tsang Chi Wo, Department of Medicine, North District Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Background Vancomycin or fidaxomicin is recommended over metronidazole for initial Clostridioides difficile infection (CDI) episode in international guidelines due to their superiority for clinical cure. However, the epidemiology of CDI is different between Hong Kong and worldwide.

Objective To study treatment failure, recurrence and their associated risk factors of metronidazole and vancomycin treatment for CDI in a regional hospital in Hong Kong.

Methods A retrospective cohort study was conducted in North District Hospital from 1st April 2013 to 31th March 2018. Primary outcomes were CDI treatment failure and recurrence rate. Secondary outcomes were complication and 30-day-all-cause mortality rate.

Results 205 patients were recruited. 192 (93.6%) and 7 (3.4%) patients received oral metronidazole and vancomycin as first CDI treatment respectively. Treatment failure rate of oral metronidazole was 19.8%, in which 14.6%, 29.8% and 40.0% for non-severe, severe and fulminant CDI respectively. Treatment failure rate of vancomycin was 0% (P=0.35). Treatment recurrence rate of metronidazole and vancomycin was 18.8% and 14.3% (P=0.98). Complication and 30-day-all-cause mortality rate was 5.4% and 27.3%. Diabetes, exposure to extended spectrum penicillin and severe and fulminant CDI were risk factors for treatment failure (P=0.02, <0.01, 0.03 respectively). Treatment failure rate of oral metronidazole reduced to 9.4% in patients without these risk factors. HbA1c >7%, severe CDI and community onset-healthcare facility associated CDI were risk factors for treatment recurrence (P=0.01, 0.02, <0.01 respectively).

Conclusion Oral vancomycin is recommended over metronidazole for initial CDI episode due to lower treatment failure rate, while oral metronidazole can be recommended for patients without risk factors for treatment failure.

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SHOULD WE INCORPORATE LIVER FIBROSIS SCREENING INTO DIABETIC COMPLICATION SCREENING PROGRAM?

Dr Wong Chun Kit, Department of Medicine, Tseung Kwan O Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Background The prevalence of nonalcoholic fatty liver disease (NAFLD) is rising globally and type 2 diabetes mellitus is an important risk factor for NAFLD patients to develop adverse liver outcomes such as cirrhosis and hepatocellular carcinoma (HCC). Local study reviews high prevalence of advanced liver fibrosis in diabetic population. A new stepwise approach is proposed to stratify the risks for liver fibrosis.

Objectives The primary aim of this study was to determine the prevalence of NAFLD and advanced fibrosis among type 2 diabetic patients using a 2 step algorithm and the secondary outcome was to identify independent predictors of NAFLD and advanced fibrosis.

Methods Type 2 diabetic patients attending diabetic complication screening program were recruited prospectively from September to December 2019. The demographics, clinical and biochemical data were evaluated. Advanced fibrosis was determined by calculating NAFLD fibrosis score, followed by transient elastography measurements.

Results Three hundred and sixty two patients were prospectively included in the study. The prevalence of NAFLD and advanced fibrosis was 77.4% and 16.9% respectively. By multivariate analysis, low HDL-cholesterol, higher waist circumference, triglyceride level and use of statins were associated with NAFLD. Higher urine albumin-to-creatinine ratio (ACR), central obesity, heart failure and use of ACE inhibitors were independent predictors for advanced fibrosis.

Conclusion Type 2 diabetic patients have a high prevalence of NAFLD with a significant proportion with concomitant advanced fibrosis. Routine screening for liver complications should be considered in patients with type 2 diabetes mellitus, particularly in obese patients with concomitant nephropathy and heart failure.

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RECTAL SUCRALFATE GEL TREATMENT IN PATIENTS WITH CHRONIC RADIATION PROCTITIS – A PILOT STUDY IN A REGIONAL HOSPITAL IN HONG KONG

Dr Wu Edmund Siu To, Department of Medicine & Geriatrics, Princess Margaret Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Objectives To evaluate the efficacy and safety of sucralfate rectal enema prepared from sucralfate oral gel for the treatment of chronic radiation proctitis, introduce the method of sucralfate gel enema preparation and administration, and assess the treatment compliance in a predominantly Chinese patient population.

Methods This single-centered prospective pilot study included 25 patients with symptomatic chronic radiation proctitis. Each patient received 20 mL of two grams twice daily sucralfate gel enema for 8 weeks, and were followed up for 24 weeks. Clinical symptoms were graded by Common Terminology Criteria for Adverse Events (CTCAE). Endoscopic findings were scored by Vienna Rectoscopy Score (VRS).

Results The mean age of patients was 70.7 years. The clinical grade for rectal bleeding had significantly improved over 24 weeks. 88% patients had clinical improvement of bleeding, and 36% patients had resolution of bleeding at 24 weeks. Patients with diarrhea (n=1) or rectal pain (n=1) also had resolution of their symptoms. There were no significant differences in endoscopic scores, hemoglobin and iron panels before and after treatment. 84% patients were compliant with the twice daily regimen. Sucralfate gel enemas were administered by patients (76%) or their partners (24%). No severe adverse event occurred.

Conclusion Sucralfate gel enema can be an effective treatment for chronic radiation proctitis. It can be safely administered by elderly Chinese patients and with satisfactory compliance rate. The positive clinical outcome in this initial experience of sucralfate gel enema provides the basis for future double blind randomized controlled trial.

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MODIFIED GLASGOW BLATCHFORD SCORE (MGBS) AS A RISK STRATIFICATION SYSTEM IN ACUTE UPPER GASTROINTESTINAL BLEEDING IN CHINESE PATIENTS: A DIAGNOSTIC ACCURACY STUDY

Dr Yong Jason Xern E, Department of Medicine & Geriatrics, Princess Margaret Hospital (Jun 2020 Gastroenterology & Hepatology Exit Assessment Exercise)

Objectives Various pre-endoscopic risk scoring systems for upper gastrointestinal bleeding (UGIB) are hampered by low implementability. The modified Glasgow Blatchford Score (mGBS) eliminates the subjective factors of GBS. This study aims to validate and compare the accuracies of GBS and mGBS in predicting clinical outcomes for acute UGIB in Chinese

patients in Hong Kong.

Methods This retrospective study was conducted from July 2018 to June 2019. Primary outcome was the need for clinical intervention (blood transfusion, endoscopic, radiological intervention or surgery). Secondary outcome was rebleeding or in-hospital mortality. Area under the curve (AUC) was calculated to assess the accuracy of GBS and mGBS. Decision curve analysis (DCA) was conducted to calculate the net benefit (NB) and area under the net benefit curves (A-NBC) over a threshold probability of 5 - 10%.

Results 411 patients (mean age 63.5; 61.1% male) were included. 29.2% patients required blood transfusion, 24.8% endoscopic haemostasis, 2.2% radiological intervention, 0.2% surgery, 4.6% rebleeding and 2.4% in-hospital mortality. For primary outcome, mGBS (AUC 0.88) is as accurate as GBS (AUC 0.88, $p = 0.053$). For secondary outcome, the mGBS (AUC 0.79) also performed as well as GBS (AUC 0.79, $p = 0.60$). DCA proved that over a threshold probability of 5 - 10%, the mGBS has similar performance to GBS in predicting primary outcome (global $p = 0.911$).

Conclusions The mGBS could substitute GBS as the pre-endoscopic risk scoring system for Chinese patients with UGIB. Automated calculation via electronic health system should enhance its clinical uptake.

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PROGNOSTIC INDICATORS OF 6-MONTH MORTALITY IN INSTITUTIONALIZED ELDERLY PEOPLE WITH ADVANCED DEMENTIA

Dr Cheung Hiu Fung, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Geriatric Medicine Exit Assessment Exercise)

Background Dementia is one of the leading causes of death in Hong Kong. Accurately estimating life expectancy in advanced dementia has been a major barrier for providing palliative care(1). Studies in USA and UK shown prognostication helps guide end-of-life decisions making(1-4). However local data was scanty.

Objective To identify the most significant prognostic indicators in RCHE residents with advanced dementia who enter the NTWC CGAT EOL program and hence create a risk score to estimate 6-month survival in those subjects.

Methods This was a retrospective cohort study conducted from July 2017 to June 2018 in NTWC RCHE. The clinical records of patients with advanced dementia under CGAT EOL care program were reviewed. The baseline characteristics and the 6-month clinical outcomes were traced. Cox proportional hazards regression was employed to identify significant prognostic indicators and their corresponding hazard ratios. The discriminatory power of the final score model was assessed using the area under the receiver operating characteristic curve (AUROC).

Result Over 6 months, 48.8% (79, n = 162) of residents with advanced dementia under CGAT EOL care program died. Four prognostic indicators namely insufficient oral intake, significant recent weight lost, presence of deep pressure ulcer or being bedfast for most of the days were found to be the most significant prognostic indicators to predict 6-month mortality with hazard ratios of 1.62, 1.81, 1.88, 2.64 respectively. A risk calculator was derived with score ranged of 0-8 points with the higher scores indicate worse survival. The overall discriminatory power predicting 6-month mortality was 0.73.

Conclusion A mortality risk calculator derived from four simple clinical variables can further improve the prediction of 6-month mortality in advanced dementia patients under CGAT EOL Care.

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THE RISK OF MAJOR BLEEDING IN ELDERLY CHINESE PATIENTS WITH ACUTE CORONARY SYNDROME TREATED WITH SINGLE AND DUAL ANTIPLATELET THERAPY IN LOCAL GERIATRIC POPULATION

Dr Wong Ka Ling, Department of Medicine & Geriatrics, United Christian Hospital (Jun 2020 Geriatric Medicine Exit Assessment Exercise)

Background To evaluate the risk of major bleeding events in elderly Chinese patients with acute coronary syndrome (ACS) treated with single and dual antiplatelet therapy (DAPT).

Methods This is a retrospective review looking at elderly patients (aged□70 years old) diagnosed with ACS who were admitted to United Christian Hospital, Hong Kong during the period between 1st January 2017 and 31st December 2017. These patients were treated with single or DAPT. Patients were categorised into aspirin only group and DAPT group. Wilcoxon rank sum test was used for continuous variables and the chi-square test was used for categorical variables. Multivariate analysis with Cox model was used for analysis of all-cause mortality at 1-year.

Results The primary outcome – There was no statistical difference in major bleeding between the two groups though major bleeding was found more common in DAPT group (6.6%) as compared with 3.2% in aspirin group (RR 2.1, 95%CI 0.8–5.4, p=0.13). The secondary outcome – after adjusting with cofounders, it showed no difference in all-cause mortality between DAPT group and aspirin only group (HR 0.82, 95%CI 0.6-1.1, p=0.18). Renal impairment, serum albumin level and Charlson Comorbidity Index were associated with all-cause mortality. There was no significant difference in cardiovascular death between the two groups (RR 0.9, 95%CI 0.7-1.2, p=0.45).

Conclusion Among elderly Chinese patients with medically managed ACS, there was no statistical significance in major bleeding risk in both aspirin only group and DAPT group. After adjusting the cofounders, there was no difference in all-cause mortality between the two groups.

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PROGNOSIS OF SEVERE DYSPHAGIA IN PATIENTS WITH DEMENTIA IN A LOCAL HOSPITAL

Dr Yau Ho Tuen, Department of Medicine & Therapeutics, Prince of Wales Hospital (Jun 2020 Geriatric Medicine Exit Assessment Exercise)

Background Elderly patients with dementia are prone to dysphagia. There is lack of data on the prognosis of patients with severe dysphagia and dementia.

Objective The primary objective is to evaluate 1-year mortality in patients with severe dysphagia and dementia. The secondary objectives are to review risk factors for mortality, need for non-oral feeding and their advance care planning.

Patients and Method This was a retrospective, single-centre, cohort study in patients discharged from a rehabilitation hospital. Elderly patients (aged ≥ 60 years) with severe

dysphagia and dementia were eligible. Patients with recent cerebrovascular accident, active malignancy, and receiving non-oral feeding were excluded. Their clinical records were reviewed up to 1 year after discharge.

Results In total, 78 patients of 971 hospital discharges with severe dysphagia and dementia were eligible. Their mean age was 88.1 (+/-8.3) years. Of them, 56 (64.1%) were residing in institutions, and 41 (52.6%) were bedridden. The 1-year mortality was 46.2%. Lower serum albumin level (p=0.022), significant weight loss (p=0.049) and number of hospital admissions within three months before index admission (p=0.031) were independently associated with 1-year mortality. Hospitalization was shown to be related to the initiation of non-oral feeding (p=0.006). Advanced care planning was conducted in 70 (89.7%) patients in the 1-year follow up. Decision on artificial nutrition and hydration was reached with surrogate decision makers in 36 (46.2%) patients.

Conclusion The results alert local physicians for poor prognostic factors and high mortality in patients with severe dysphagia and dementia. Advance care planning should be advocated for all patients with dementia and dysphagia.

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IMPACT OF PHILADELPHIA CHROMOSOME/BCR-ABL1 FUSION GENE ON THE OUTCOMES OF B-CELL ACUTE LYMPHOBLASTIC LEUKEMIA IN THE TYROSINE KINASE INHIBITOR ERA - A RETROSPECTIVE MULTICENTER ANALYSIS

Dr Chiu Hiu Ching Karen, Department of Medicine, Pamela Youde Nethersole Eastern Hospital
(Jun 2020 Haematology and Haematological Oncology Exit Assessment Exercise)

Background and objectives In adults with B-cell Acute Lymphoblastic Leukaemia (B-ALL), the most commonly found cytogenetic abnormality is the Philadelphia Chromosome (Ph); which is a well-known adverse prognostic factor(1). However, the outcomes of Philadelphia Chromosome positive (Ph+) B-ALL patients have improved significantly since the incorporation of BCR-ABL tyrosine kinase inhibitors (TKI) into first-line treatment(2-5) . The aim of this study is to compare the outcomes of Ph+ and Philadelphia Chromosome negative (Ph-) B-ALL patients after the widespread addition of TKI into standard therapy in Hong Kong local hospitals

Methods Adult B-ALL patients diagnosed between 1st January 2011 to 31st Dec 2018 in three Hong Kong centres (Queen Mary Hospital, Queen Elizabeth Hospital and Pamela Youde Nethersole Eastern Hospital) were recruitedinto this retrospective study. The primary outcomes of interest were overall survival (OS) , progression free survival (PFS) and relapse rate (RR).

Results A totalof 91 patients, age between 18-95 years old,were recruited into this study. The 2-year OS and PFS were60.3%and45.7%, respectively. The median OS of Ph- group was 45.6 months andmedian OS of Ph+ group was not reached, with a median follow-up time of 25 months. There were no statistically significant differencesin OS (unadjusted hazard ratio, HR = 0.76; 95% confidence interval, CI: 0.41 – 1.41; log-rank test P = 0.384), PFS (unadjusted HR = 0.70; 95% CI: 0.41 -1.22; log-rank test P = 0.209) and RR(57.4% vs 46.0% in Ph- and Ph+ respectively; relative risk = 0.80; 95% CI: 0.52 – 1.23; P = 0.295),with regards to Ph status. On multivariate analysis, presence of Ph was notan independent predictive factor of OS or PFS.

Older ageat diagnosis and presence of additional high risk cytogenetics were associated with inferior survival outcomes.

Conclusion In this local study, Ph status was not predictive of inferior survival outcomes in adult B-ALL patients after the widespread usage of TKI. Similar findings were also observed in overseas cancer registries and reported in literature.

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TREATMENT OUTCOME OF ADULT PATIENTS WITH ACUTE LYMPHOBLASTIC LEUKEMIA WITH HYPERCVAD: TEN-YEAR EXPERIENCE AND THE WAY FORWARD

Dr Kong Shun Yin, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Haematology and Haematological Oncology Exit Assessment Exercise)

Introduction The age-adjusted incidence of acute lymphoblastic leukemia (ALL) has increased. However, local data of treatment outcome of adult ALL patients with HyperCVAD, one of the most common regimens for adult ALL, are limited.

Objective This study aims to review the treatment outcome of adult ALL patients and to identify prognosticators for survival outcome. Future perspectives of adult ALL treatment strategies in Hong Kong will also be discussed.

Methodology This is a retrospective analysis of two tertiary haematology centres in Hong Kong from January 2007 to September 2017. Enrolled patients were treated with HyperCVAD tyrosine kinase inhibitor (TKI). Patient would be referred for allogeneic haematopoietic stem cell transplantation (HSCT) after complete remission (CR) if they fulfilled the criteria. Outcome measures included CR rate, relapse rate, overall survival (OS) and relapse-free survival (RFS). Various parameters would be studied for their prognostic significance.

Result Eighty-seven newly diagnosed ALL patients (Male to female ratio: 1.4:1) were recruited for analysis. The median age at diagnosis was 42 years old. High-risk group accounted for 46% of patients. With HyperCVAD, the overall CR rate was 93% and the induction mortality was 3%. While awaiting HSCT, 26% of patients relapsed and 40% of them could attain CR2. Overall, 68% of patients with CR underwent HSCT and post-HSCT relapse rate was 54%. Both standard-risk and high-risk patients had comparable post-HSCT relapse rate. Patients with HSCT had a significantly longer survival than those without HSCT (5-year OS: 43.3% vs. 9.4%, $p < 0.01$ and 5-year RFS: 35.4% vs. 21.7%, $p = 0.02$). Patients who achieved CR1 after the first cycle of chemotherapy had a longer 5-year OS (39.1% vs. 10%, $p = 0.02$) than those after the second cycle. Standard-risk and high-risk groups had comparable survival outcome. In multivariate analysis (MVA), HSCT and achievement of CR1 after the first cycle of HyperCVAD strongly predicted longer OS. Patient aged < 40 years old had a higher 5-year OS (39.9% vs. 23.5%, $p = 0.03$) than patient aged ≥ 40 years old but this OS benefit was not proven in MVA.

Conclusion Despite a high CR rate with HyperCVAD, adult ALL patients still experienced high relapse rate prior to and after HSCT and hence poor survival. Treatment modification in various subgroups and more accurate disease monitoring tools should be considered.

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A RETROSPECTIVE STUDY ON THE CLINICAL FEATURES AND OUTCOMES OF PATIENTS WITH SYSTEMIC AL AMYLOIDOSIS IN A SINGLE CENTER IN HONG KONG

Dr Lau Wai Pan, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Haematology and Haematological Oncology Exit Assessment Exercise)

Objective To retrospectively investigate the clinical features, current treatment regimens, clinical outcome and prognostic factors in patients with systemic amyloid light chain (AL) amyloidosis in our center in Hong Kong.

Methods The medical records of patients who were diagnosed with systemic AL amyloidosis in Queen Elizabeth Hospital from 2006 to 2019 were reviewed. Patient's characteristics including presenting symptoms, age, gender, blood pressure, major organ function (including cardiac and kidney), free light chain level, cardiac enzyme, bone marrow status, treatment received and response were analyzed.

Results A total 44 patients were evaluated in this cohort analysis. The median age was 66.2 with male predominate in this study. Proteinuria was found in 31% of patients as the initial presentation, followed by 20% with clinical limb edema and 15.9% of with shortness of breath. The most affected organ by AL amyloidosis was kidney which accounted for 63.6%, followed by 56.8% of them with cardiac involvement. The median overall survival was 45 months. The median overall survival in the subgroup with cardiac amyloidosis was 17.0 months, compared to 82.0 months in the subgroup with non-cardiac involvement (P value = 0.03). Four associated prognostic factors for overall survival were identified in this study. Age >/=65, difference in free light chain>180 mg/L, systolic blood pressure </=100mmHg at diagnosis and elevated serum HsTroponin I /Troponin I level predicted poor prognosis. Overall response rate of 84% was seen in bortezomib based treatment, compared to 42.9% in non- bortezomib treatment arm as front-line treatment of amyloidosis.

Conclusion The clinical features and outcome of patients with systemic AL amyloidosis in this cohort are similar to the data from international centers. Diagnosis could be challenging in some of the cases due to the non-specific sign and symptom on initial presentation. Early recognition of disease and rapid initiation of treatment is essential to reduce irreversible organ damage by light chain amyloid and further improve outcome of the disease.

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MULTIPLE MYELOMA IN ELDERLY PATIENTS – REAL WORLD LOCAL DATA

Dr Lee Tsui Yin Jaime, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Haematology and Haematological Oncology Exit Assessment Exercise)

Background The incidence of multiple myeloma (MM) increases with age. The number of older myeloma patients is growing. However, elderly MM patients are often under-represented in clinical trials. The aim of this community-based study is to describe the disease characteristic, measure clinical outcome and identify the factors that are associated with survival in elderly MM patients.

Patients and method We retrospectively reviewed 123 patients who were aged 65 years or above, had newly diagnosed multiple myeloma and were treated in Queen Elizabeth Hospital from 1st January, 2012 to 31st December, 2017. We analysed the clinical characteristics, response to first line treatment, clinical outcome and factors affecting survival.

Results The median age of diagnosis was 77 years. Among the 123 patients, 35% of the patients were 80 years old or above, 59.3% were male patients, 50% had a Charlson Comorbid Index (CCI) of 2 or above and 52.9% had Stage III disease. Majority of our patients received

thalidomide-based treatment and doublets regimen. The median duration of follow up was 32 months. The overall response rate was 62.6%. The complete remission rate was 3.3%; the very good partial response rate was 26.8%; the PR rate was 32%. Around 5% of patients had progressive disease. The median progression free survival (PFS) was 16 months. The presence of high-risk cytogenetics was independently associated with PFS. The median overall survival (OS) was 32.5 months. CCI >/=2, hypercalcemia and failed response to first line treatment were independently associated with poor OS.

Conclusion In elderly myeloma patients who were aged 65 years or above, both patients' chronological age and comorbidity with the use of CCI as assessment tool, were found to be an important factor associated with survival, and should be considered in formulating the treatment plan.

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COMPARISON OF CLINICAL OUTCOME FOLLOWING G CSF ALONE VERSUS G CSF AND CYCLOPHOSPHAMIDE AS PERIPHERAL BLOOD STEM CELL MOBILIZATION IN MULTIPLE MYELOMA

Dr Tam King Wai, Department of Medicine & Geriatrics, United Christian Hospital (Jun 2020 Haematology and Haematological Oncology Exit Assessment Exercise)

Background Autologous haematopoietic stem cell transplantation is standard treatment for multiple myeloma. Successful stem cell mobilization and harvest is the first and important step for transplantation. Use of granulocyte colony stimulating factor (G CSF) alone and cyclophosphamide with G CSF are the two most commonly used mobilization strategies. There is no straightforward consensus on the selection and application of mobilization strategies and the optimal strategy is still unclear.

Objective To compare the mobilization outcome between G CSF alone versus cyclophosphamide and G CSF for multiple myeloma patients in local perspective.

Method This is a retrospective study of two local hospitals in Hong Kong. Patients diagnosed of multiple myeloma with age of 18 years old or above who had their first stem cell mobilization within study period of January 2013 to December 2018 are included. Stem cell mobilization outcome, subsequent transplant engraftment and survival data were reviewed

Result Total 74 patients were identified of which 47 used G CSF alone and 27 used cyclophosphamide plus G CSF (CTX+G CSF) as mobilization strategy. Total stem cell yield was significantly higher in CTX+G CSF group (median of 14.11 vs. 6.72 x 106 cells/kg, $p < 0.01$). Less number of apheresis (median of 1 vs. 2 sessions, $p < 0.01$) was required for CTX G CSF group but the total duration of mobilization to stem cell collection process was longer (median of 11 vs. 6 days, $p < 0.01$). Subgroup analysis of 15 patients from G CSF alone group with addition of Plerixafor did not found significantly difference on these mobilization outcome analysis except for a significant improvement on the success rate on collecting the optimal target stem cell dose of $\geq$ 5x 106 CD 34+ cells/kg comparable to CTX+G CSF group (86% vs. 91%, $p = 0.63$). 30% of CTX GCSF group experienced febrile neutropenia. With regard to the transplant outcome analysis, CTX GCSF group showed faster neutrophil engraftment (median of 10 vs. 11 days) but no survival difference.

Conclusion CTX+G CSF mobilization achieve better stem cell dose in the expense of risk of febrile neutropenia and longer mobilization process. Addition of Plerixafor to G CSF improves stem cell collection without added toxicities.

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A RETROSPECTIVE REVIEW OF MONOCLONAL ANTIBODY IMMOBILISATION OF THE PLATELET ANTIGENS (MAIPA) TO DETECT AUTOANTIBODIES IN IMMUNE THROMBOCYTOPENIA PATIENTS AND ITS CLINICAL SIGNIFICANCE IN LOCAL HONG KONG POPULATION

Dr Wong Ka Yee Kelly, Department of Medicine, Pamela Youde Nethersole Eastern Hospital
(Jun 2020 Haematology and Haematological Oncology Exit Assessment Exercise)

Background and objectives Immune thrombocytopenia (ITP) is an acquired disorder resulting from autoantibodies against platelet surface glycoproteins (GPs). It remains a diagnostic challenge, as it is a diagnosis of exclusion. This retrospective review aims to evaluate the clinical significance of detecting anti-platelet autoantibodies by using Monoclonal Antibody Immobilisation of the Platelet Antigens (MAIPA) in the diagnosis of ITP in Hong Kong. Furthermore, the initial and sustained platelet response to treatment were evaluated.

Methods Adult patients (age 18 or above) were recruited retrospectively in this review. Patients with thrombocytopenia referred to Queen Mary Hospital laboratory to have MAIPA assay performed between 1st January 2016 to 31st December 2018 were included.

The prevalence of autoantibodies against GPs using MAIPA test in this cohort was evaluated. The treatment response in patients with or without autoantibodies was analysed according to the treatment regimes. The primary outcome was the initial treatment response and the secondary outcome was the sustained treatment response at 12 months.

Results Of the 108 enrolled patients, 51 patients (47%) had autoantibodies. Amongst those with autoantibodies, 78% of them had glycoprotein IIb/IIIa, 49% had GP 1b/IX and 8% had GP Ia/IIb. MAIPA assay was found to have a high specificity (85%) with a positive predicted value of 79%. Patients with autoantibodies had a significantly lower baseline median platelet count of 18 ×10 9/L (p value 0.035) compared with patients without autoantibodies (32 ×10 9/L).Patients with autoantibodies also had more bleeding symptoms on clinical presentation especially epistaxis (p value 0.021). Overall there was no significant difference between the two groups in terms of the initial response and sustained response across all treatment modalities.

Conclusions This is a retrospective review of ITP patients with and without autoantibodies in the local Hong Kong population. ITP patients with autoantibodies appeared to have a significantly lower baseline platelet counts with more bleeding symptoms on clinical presentation. MAIPA assay plays a role to support the diagnosis of ITP. Overall, there was no difference in treatment response associated with the presence of autoantibodies.

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COLONISATION WITH CARBAPENEMASE-PRODUCING ENTEROBACTERIACEAE: RISK FACTORS OF ACQUISITION ANDPREDICTORS OF CLINICAL OUTCOMES IN ADULT PATIENTS AT A LOCAL TEACHING HOSPITAL

Dr Tam Anthony Raymond, Department of Medicine, Queen Mary Hospital
(Jun 2020 Infectious Disease Exit Assessment Exercise)

Background Colonisation with multidrug-resistant organisms (MDROs) is a significant risk factor for theirsubsequent infection. Carbapenemase-producing Enterobacteriaceae (CPE) is an important MDRO since its resistance mechanism is plasmid-mediated with an ability of efficient transmission among bacteria and hosts. Local publications were scarce to date on risk factors of CPE colonisation.

Methods It was a retrospective case control study with case patients selected from adults (aged 18 and above) newly identified to havegastrointestinal colonisation with CPE at Queen Mary Hospital (QMH), Hong Kong, from 1st January 2017 through 31st December 2018. Control subjects were selected from adult patients admitted to isolation ward of QMH for reasons apart

fromcolonisation of CPE or other MDROs during the same period. Their clinical data were reviewed and compared to identify risk factors of colonisation and predictors of clinical outcome.

Results 514 patients were colonised with CPE. 470 patients were identified as control. From multivariate analysis, independent risk factors of CPE colonisation were higher Age-adjusted Charlson's Comorbidity Index (ACCI) (OR 1.12), use of antibiotics (OR 4.71) and proton-pump inhibitors (OR 1.81) in the preceding 3 months, presence of wounds (OR 8.52), hospitalisation locally in the preceding 3 months (OR 2.39) and overseas in the preceding 12 months (OR 3.77). 6-month mortality was not different between the two groups. Higher ACCI and prior antibiotic use were independent predictors of emergency admission andmortality in the subsequent 6 months.

Conclusion Optimising antibiotic use through antibiotic stewardship program would improve patients' prognosis.

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PROGNOSTIC BIOMARKER OF CLINICAL OUTCOME IN LOCALLY ADVANCED RECTAL CANCER IN CHINESE PATIENTS

Dr Ho Sze Ki Sandy, Department of Medicine & Geriatrics, Princess Margaret Hospital (Jun 2020 Medical Oncology Exit Assessment Exercise)

Background Colorectal cancer is the most common cancer in Hong Kong and over 50% of new cases are located in the rectum. Neoadjuvant chemoradiotherapy (NCRT) is one of the standard treatments for locally advanced rectal cancer (LARC), where pathological complete response (ypCR) rate has been traditionally used as a surrogate endpoint of survival. In recent years, a relatively new biomarker known as the Neoadjuvant Rectal (NAR) score has been consistently shown to correlate with survival in clinical studies. NAR score is a composite endpoint combining information on clinical and pathological staging obtained before and after NCRT. Other well-known biomarkers such as the circumferential resection margin (CRM) and tumour regression grading (TRG) (based on pathological pTRG, and magnetic resonance imaging - mrTRG guided response criteria) also warrant validation in local populations.

Objectives The main objective of this study is to investigate the factors that may influence the rate of ypCR after NCRT, such as the type of chemotherapy, tumour location, presence of involved CRM and extramural vascular invasion (EMVI) on MRI and degree of tumour down-staging and mrTRG. The other objective is to validate the prognostic significance of NAR score in local population and any factors that are associated with a lower NAR score.

Method The clinical and MRI data of patients with LARC who received NCRT at the Prince of Wales Hospital between August 2006 to October 2018 were retrospectively collected and analyzed. The mrTRG score grade were evaluated by radiologists. Fisher's Exact Test was used to determine any correlation between categorical variables and Cox regression was used to determine any interactions between covariates. The Kaplan-Meier method was used to estimate time-to-event endpoints

Results The data of 209 patients with LARC who had MRI staging at diagnosis and NCRT were retrieved. Sixteen patients had suboptimal response to NCRT and received consolidation chemotherapy, of whom 8 underwent subsequent surgery. Of the 193 patients who had optimal response to NCRT and had surgery, the mean age was 62 and the male-to-female ratio was 2.94: 1. Tumour down-staging was the only independent prognostic factor which predicted ypCR ($p<0.0001$). NAR score was associated with overall survival (OS) (hazard ratio, HR=1.042, 95% confidence interval, CI: 1.021-1.064, $p<0.0001$), disease-free survival (DFS) (HR=1.042, 95% CI: 1.022-1.062, $p<0.0001$), locoregional recurrence-free survival (LRFS) (HR=1.070, 95% CI:1.039-1.102, $p<0.0001$) and distant recurrence-free survival (DRFS) (HR=1.034, 95%CI: 1.012-1.056, $p=0.002$). Patients who had ypCR to NCRT was associated with a lower NAR score ($p<0.0001$), but ypCR was not associated with survival.

Conclusion NAR score (but not ypCR) is an independent prognostic marker of survival and disease recurrence in a cohort of Chinese patients who underwent NCRT for LARC.

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HIGH CUT-OFF HEMODIALYSIS IN PATIENTS WITH CAST NEPHROPATHY: A LOCAL CENTRE EXPERIENCE

Dr Li Cheuk Him, Department of Medicine & Geriatrics, Princess Margaret Hospital (Jun 2020 Nephrology Exit Assessment Exercise)

Background Cast nephropathy occurs in around 30-40% of multiple myeloma patients. For patients who require dialysis at presentation, more than 80% remain dialysis dependent. Rapid reduction of serum free light chain (FLC) level is important to improve renal outcomes. Extracorporeal treatment with high cut-off hemodialysis (HCO-HD) has been used to remove free light chains. However, the evidence on the benefits of high cut-off hemodialysis is not conclusive and local data is limited.

Objectives The study aimed to compare cast nephropathy patients with and without using HCO-HD as an adjunct to chemotherapy on their renal response and overall survival. The adverse events related to HCO-HD, such as intradialytic hypotension and cardiac arrhythmia, were also studied. The requirement of albumin infusion during HCO-HD sessions was also examined.

Methods This retrospective study assessed multiple myeloma patients with biopsy-proven cast nephropathy at Princess Margaret Hospital from January, 2007 to July, 2019. The demographic, clinical and laboratory data were retrieved from Electronic Patient Record (ePR) and Clinical Data Analysis and Reporting System (CDARS) for analysis.

Results A total of 32 patients were analyzed. 17 patients were treated with HCO-HD as an adjunct to chemotherapy, whereas 15 patients were not. A greater reduction in creatinine at 3 months was observed in the HCO-HD group (341 μmol/L vs 142 μmol/L, $p = 0.701$), but there was no statistically significant difference in the renal responses at 3 months ($p = 0.925$). There was also a greater reduction in FLC at 3 months in the HCO-HD group (8568 mg/L vs 5075 mg/L, $p = 0.471$). For patients on dialysis at baseline, the proportion of patients achieving dialysis independence showed no statistically significant difference (at 3 months: 27.3% vs 40%, $p = 1.000$; at 6 months: 36.4% vs 60%, $p = 0.596$; at 12 months: 45.5% vs 60%, $p = 1.000$). There was no statistically significant difference in the mortality between the HCO-HD and the non-HCO-HD groups (at 3 months: 11.8% vs 6.7%, $p = 1.000$; at 6 months: 25% vs 6.7%, $p = 0.333$; at 12 months: 40% vs 33.3%, $p = 0.705$). HCO-HD was generally well tolerated without the need of early termination.

Conclusion There was a trend towards a higher reduction in creatinine and FLC level with the use of HCO-HD as adjunct therapy, but there was no additional benefit in renal response, dialysis independence or overall survival. Future studies with a larger sample size and a more intensive HCO-HD regimen will be helpful to determine the efficacy of HCO-HD in local population.

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RETROSPECTIVE REVIEW OF YOUNG ISCHAEMIC STROKE PATIENTS IN A REGIONAL CENTRE IN HONG KONG: RISK FACTORS, AETIOLOGIES AND OUTCOMES

Dr Chau Siu Kwan Chris, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Neurology Exit Assessment Exercise)

Background Young ischaemic stroke comprises 5-10% of all strokes. Aetiologies are more diverse than for adult strokes. Data on the impact on patients and society are few, especially

in Asia localities.

Objectives We aim to review the demographics, risk factors, aetiologies and outcome of young ischaemic stroke patients in a regional centre in Hong Kong.

Methods Patients aged 18 to 45 years admitted between 2016 and 2018 for ischaemic stroke were included. Clinical, laboratory and radiological findings were reviewed. Stroke aetiologies were classified by the Baltimore-Washington and TOAST classification. Outcomes studied included modified Rankin score (mRS), modified Barthel Index (mBI) and ischaemic stroke recurrence. Categorical comparison of outcomes was performed stratified by age and aetiologies.

Results A total of 94 patients with median age of 40 were included. Mean follow-up duration was 2.29 years. The majority (92%) had mild strokes (NIHSS score 0-8). Vascular risks factors were prevalent: 46.8% had hypertension, 60.6% had hyperlipidaemia and 34.0% had diabetes or pre-diabetes. Small vessel occlusion was the most common aetiology by both the Baltimore-Washington and TOAST classification. Upon hospital discharge, 87.2% patients remained independent (mRS 0-2). Case fatality was 3.2%. Calculated recurrent ischaemic stroke incidence proportion was 1.85%/person year. A trend of association with ischaemic stroke recurrence was observed for cardioembolic stroke.

Conclusion Young ischaemic stroke patients in our centre had a high prevalence of vascular risk factors. The most common aetiology was small vessel occlusion. The majority remained independent. Short-term ischaemic stroke recurrence was low. Literature review however suggested significant long-term mortality and health burden.

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FACTORS PREDICTING FAVOURABLE OUTCOME FOR MECHANICAL THROMBECTOMY IN ACUTE ISCHEMIC STROKE PATIENTS

Dr Cheung Pak Kin, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Neurology Exit Assessment Exercise)

Background Multiple randomized controlled trials since 2015 demonstrated that mechanical thrombectomy is superior to medical therapy for the treatment of acute ischemic stroke patients with anterior circulation large vessel occlusion.

Objective The aim of the study was to describe the outcome of acute ischemic stroke patients undergoing mechanical thrombectomy and investigate the predictors of favorable prognosis in this group of patients after thrombectomy.

Methods A retrospective cohort study was conducted on a total of 91 patients with acute ischemic stroke due to anterior circulation large vessel occlusion who received mechanical thrombectomy from January 2015 to August 2019 in Tuen Mun Hospital of Hong Kong. Modified Rankin scale (mRS) was used to evaluate the outcome of the patients 3 months after mechanical thrombectomy. Related factors of favorable outcome were analyzed by univariate and multivariate logistic regression.

Results 42.9% (39/91) of patients were functionally independent (mRS □ 2) at 3 months

after receiving endovascular treatment. 28.6% (26/91) of patients achieved modified Barthel index (mBI) □ 90 at 3 months. Mortality was 20.9% (19/91). 11.0% (10/91) of patients had symptomatic intracranial hemorrhage. Outpatient status upon referral for mechanical thrombectomy was associated with a better functional outcome significantly (P = 0.007). History of ischemic heart disease and high post 24 hours NIHSS were associated with worse functional outcome significantly (P = 0.029 and P < 0.001 respectively).

Conclusion Functional outcome and mortality after mechanical thrombectomy in a locoregional hospital of Hong Kong are in line with international trials. Outpatient stroke, history of ischemic heart disease and post 24 hours NIHSS are significant prognostic predictors of functional outcome.

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CLINICAL PRESENTATION AND COURSE OF PATIENTS WITH MOTOR NEURON DISEASE – A TERTIARY CENTRE EXPERIENCE IN HONG KONG

Dr Ho Yee Ting Christina, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Neurology Exit Assessment Exercise)

Motor neuron disease (MND) is a devastating neurodegenerative condition where most patients ultimately develop severe complications leading to respiratory failure and death. In this study, the clinical courses of 41 patients who attended a multidisciplinary clinic of a tertiary neurology referral centre in Hong Kong over a 9.5 year follow-up period was analyzed. This is one of the first local studies that explores the clinical features and progression of Chinese MND patients.

The mean age of symptom onset was 57.3 years, with half of the patients presented with pure limb weakness at onset. The 5-year survival rate was 34.1%, with a mean survival time from the symptom onset of 70.3 months and a mean age of death at 64 years.

In this cohort, clinical progression as represented by ΔFS1 was the only factor that was found to be associated with patients' overall survival time and the time to respiratory failure from symptom onset. Riluzole use of more than 6 months and BMI at first presentation to HMV clinic were both positively correlated with the time to respiratory failure, despite no significant effect on survival was demonstrated. The use of NIV was not associated with significant survival benefit in our population.

Further studies and statistical analysis might be needed to translate ΔFS1 into a potential surrogate marker for prediction of patients' overall prognosis and survival.

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A RETROSPECTIVE STUDY ON THE SAFETY AND EFFICACY OF MEDICAL PLEUROSCOPY IN MANAGEMENT OF PLEURAL EFFUSION IN A LOCAL HOSPITAL

Dr Cheng Yiu Fai, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Respiratory Medicine Exit Assessment Exercise)

Background Pleural effusion is a common clinical condition which would cause significant morbidity or even mortality. However, delay in diagnosis is common as thoracentesis and closed pleural biopsy may not provide adequate information. Medical pleuroscopy is a minimally invasive procedure which allow targeted pleural biopsy thus increase diagnostic yield.

F oreign studies reported a good diagnostic accuracy and safety profile, yet local data is scarce. Local experience can certainly provide insight in the application of this technique to facilitate the management of pleural effusion

Objectives To study the diagnostic accuracy, safety and utilization of medical pleuroscopy in a local district hospital.

Methods This is a retrospective study on all the patients with medical pleuroscopy performed in our unit between July 2016 and June 2019. Medical records were reviewed and data on demographics, investigation results before procedure, diagnostic results, complications and mortality were coll ected. S tatistical analysis was performed by SPSSv26. Diagnostic accuracy of me dical pleuroscopy was reported and compared. Chest drain duration and survival were analyzed in sub-group.

Results A total of 72 patients had undergone medical pleuroscopy in the study period. Pleural metastasis of lung carcinoma (50%) and pleural tuberculosis (22%) were 2 most common positivity findings. The sensitivity, specificity, positive predictive value and negative predictive value of medical pleuroscopy were 87.7%, 100%, 100%, and 68.2% r espectively. Test sensitivity was superior in pleural biopsy from medical pleuroscopy (7 8.9%) than pleural fluid from medical pleuroscopy 31.6%)31.6%). Presence of pleural lesions in computed tomography was associated with positive pleur al biopsy results from medical pleuroscopy ($p < 0.001$). Major and minor complication rates were 2.8% and 22.2% respectively. No mortality was recorded.

Conclusions Medical pleuroscopy has a high diagnostic accuracy and satisfactory safety profile which is similar to global data. Computed tomography was a potential favorable investigation of choice for selection of patients for medical pleuroscopy. Further prospective study is recommended to identify any favorable se lection criteria for improving the diagnostic accuracy of medical pleuroscopy.

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PULMONARY MANIFESTATIONS OF IDIOPATHIC INFLAMMATORY MYOPATHIES – PERSPECTIVE IN A REGIONAL ACUTE HOSPITAL IN HONG KONG AND A REVIEW OF LITERATURE

Dr Lam Luk Ping, Department of Medicine, Pamela Youde Nethersole Eastern Hospital (Jun 2020 Respiratory Medicine Exit Assessment Exercise)

Background Interstitial lung disease (ILD) is the hallmark of pulmonary manifestation in idiopathic inflammatory myositis (IIM) and is associated with high morbidity and mortality. However, local data are limited.

Objectives To evaluate the clinical characteristics of IIM-ILD, to identify factors associated with ILD related prognosis and to review the literature on the subject.

Methods A retrospective study was performed in a regional acute hospital in Hong Kong on patients with IIM from 1997 to 2019. The prevalence of IIM-ILD was evaluated. Clinical characteristics, lung function parameters, radiological features, treatment and clinical outcome of patients with and without ILD were compared. Multiple logistic regression method was used to evaluate the risk factors of ILD and mortality. Cox proportional hazards regression model was used to compare survival of patients with and without ILD.

Results A total of 154 patients with IIM were analyzed, of whom 67 (43.5%) suffered from ILD. There was significant difference in the ILD prevalence among different types of IIM: 32.9% in dermatomyositis (DM), 90.9% in clinically amyopathic dermatomyositis (CADM), 33.3% in polymyositis (PM), 70% in anti-synthetase syndrome (ASS), 66.7% in overlap myositis (OM) and 100% in necrotizing myositis (NM); ILD was not associated with inclusion body myositis (IBM) and juvenile onset DM (JDM). Subclinical ILD constituted 29.9% of patients with ILD.

Up to 10.4% and 20.9% patients had confirmed MA-ILD before and after the diagnosis of IIM respectively, while 68.7% patients had concurrent diagnosis of ILD and IIM. Rapidly progressive ILD (RP-ILD) were identified in 20.9% patients. Radiological abnormalities were predominantly distributed in the lower lobes and subpleural regions in ILD ($p<0.005$, <0.005 respectively). Significantly lower DLCO/VA adjusted (3.83 ± 0.73, $p=0.032$) was observed in ILD group. The overall mortality rate of patients with ILD was 37.3% (25/67, $p=0.222$). The mean time from diagnosis of IIM without ILD to death was 60.26 ± 89.6 months, which is significantly longer than that observed in IIM patients with ILD (35.88 ± 71months, $p=0.006$). The 1-, 3-, 5-, 10-year survival of patients with ILD were 36%, 20%, 16%, 0% respectively. CADM-ILD is associated with the worst survival ($p<0.005$). The commonest cause of death was infection (51.5%). Decreased exercise tolerance ($p=0.033$) and lymphopenia ($p=0.008$) were independent factors associated with the development of ILD. Because of the small sample size, statistically significant independent prognostic indicators could not be identified by multivariate analysis.

Conclusion ILD is a critical prognostic factor in IIM patients, especially in those with CADM. RP-ILD and infection attribute to additional unfavorable outcome. Lymphocyte count, an easily available test, can aid in prediction of ILD and mortality.

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THE VALUE OF IMPULSE OSCILLOMETRY IN ASSESSMENT OF ASTHMA PATIENT WITH NEGATIVE BRONCHODILATOR RESPONSE

Dr Ma Kei Chuen, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Respiratory Medicine Exit Assessment Exercise)

Background Not all asthma patients fulfill the Global Strategy for Asthma Management and Prevention (GINA) criteria of significant bronchodilator response due to its fluctuating clinical course and so it is sometimes difficult to characterize the small airway properties of asthma patients. Impulse oscillometry (IOS) is a noninvasive technique to characterize the small airway properties of the lung by measuring the impedance of the respiratory system.

Aim This study aimed to evaluate the value of impulse oscillometry (IOS) in diagnosis of asthma with negative bronchodilator response

Methods Patients who were diagnosed to have asthma by respiratory specialists were recruited with both impulse oscillometry and spirometry performed. The parameters of impulse oscillometry, “resistance”, “reactance”, ‘frequency dependent change’, “resonance frequency” and “reactance area” were assessed. The oscillometric data in baseline and post-bronchodilator administration were compared for assessment of airflow resistance and lung compliance. Patients who are smokers and had evidence of concomitant lung diseases were excluded.

Results Total 113 asthma patients were recruited. 26 asthma patients have positive bronchodilator response(BDR+), 87 patients have negative bronchodilator response (BDR-) and there are 65 controls. All individuals are non-smokers.

Irrespective of the bronchodilation status of the asthma patients, the resistance at 5Hz (R5), frequency dependent change (R5-R20), reactance at 5Hz (X5), Resonance frequency (Fres) and Area of Reactance (Ax) among the asthma patients are statistically significantly different from the controls. The asthma patients with positive bronchodilator response (BDR+) and the asthma patients with negative bronchodilator response (BDR-) shared similar characteristics among these oscillometric parameters.

The bronchodilation profile of oscillometric parameters are in line with the spirometric results. Among asthma patients with positive bronchodilator response (BDR+), bronchodilator administration could induce significant oscillometric response in changing the resistance at 5Hz (Δ R5), resistance at 20Hz (Δ R20), frequency-dependent change (Δ R5 - R20), resonance frequency (Δ Fres) and area of reactance (Δ Ax). Such response is not seen in asthma patients

with negative bronchodilator response (BDR-) and controls.

Conclusions Impulse oscillometric data serves as an important supplementary information to spirometric bronchodilator responsiveness data. Our results support the hypothesis that impulse oscillometry may be a clinically useful complementary method for the assessment of small airway obstruction and bronchodilation in adult asthma patients. Patient with clinical symptoms and characteristics suggestive of asthma, IOS can help screen out those asthmatic patients irrespective of their bronchodilator response.

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PLEUROSCOPY IN THE MANAGEMENT OF UNILATERAL EXUDATIVE PLEURAL EFFUSIONS

Dr Se Hoi Ue, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Respiratory Medicine Exit Assessment Exercise)

Background Initial evaluation of unilateral pleural effusion includes chest radiographs and diagnostic pleural aspiration with fluid analysis. A substantial portion of such cases would remain undiagnosed after initial investigations and further diagnostic procedures would be warranted. Pleuroscopy, performed under conscious sedation, has emerged a useful tool as a subsequent step of investigation. Local data on the utilisation of pleuroscopy is limited. It remains unclear whether pleuroscopy performed in Hong Kong could achieve the high diagnostic performance reported in oversea studies.

Objectives 1. To study the diagnostic yield and complication rate with the use of pleuroscopy in unilateral exudative pleural effusions over a 12-year period

2. To evaluate our initial experience in the use of rigid pleuroscope in the management of unilateral exudative pleural effusion

Methods
A retrospective study was carried out in Queen Elizabeth Hospital, a regional hospital and tertiary referral centre in Hong Kong. Data from all consecutive patients who underwent pleuroscopy from 1 June 2007 to 30 September 2019 was retrieved. Descriptive analysis was performed for demographic data, pleuroscopic results and procedural complications. Factors that could possibly affect the diagnostic yield or complication rate were evaluated.

Results Altogether 165 patients underwent pleuroscopy during the 12-year period. Pleuroscopic biopsies were obtained in all but one case (n= 164). In 139 cases (84.8%), pleuroscopic biopsies led to the final diagnoses. For diagnoses of malignant pleural effusion and tuberculous pleuritis, diagnostic sensitivities of pleuroscopy were 80.2% and 97.7% respectively. Diagnostic specificities for both diagnoses were 100%. Complications were uncommon (n=14, 8.5%), although there was one procedure-related mortality (0.6%). Findings of pleural nodules or masses during pleuroscopy were associated with a better diagnostic yield (OR 7.04, 95% confidence interval (CI) 2.40 – 20.64, $p < 0.001$). The finding of 'sago-like nodules', in particular, had 100% specificity for diagnosis of tuberculous pleuritis in this study. Large pleural effusions (occupying > 2/3 of hemithorax) was associated with a lower complication rate (OR 0.23; 95% CI: 0.08 – 0.69; p=0.01).

Conclusion Similar to the findings of international medical literature, pleuroscopy can achieve high diagnostic yield and a low complication rate in our local setting.

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APPLICATION OF THE STOP-BANG QUESTIONNAIRE WITH A MODIFIED SCORING MODEL ON DETECTION OF UNDIAGNOSED OBSTRUCTIVE SLEEP APNEA

Dr Yip Chi Yuen, Department of Medicine & Geriatrics, Caritas Medical Centre (Jun 2020 Respiratory Medicine Exit Assessment Exercise)

Background The STOP-BANG questionnaire is a simple screening tool for Obstructive Sleep Apnea (OSA). It contains 2 components (STOP and BANG) using 8 (yes/no) clinical questions scoring 0 or 1 point each, with respective mnemonics viz. **S**noring, **T**iredness, **O**bserved apnea, blood **P**ressure, **B**ody Mass Index (BMI), **A**ge, **N**eck circumference and male **G**ender, making a total score of 0 - 8. A score of 0 - 2, 3 - 4 or 5 - 8 categorizes patients into low, intermediate or high risk of having moderate to severe OSA (Apnea-Hypopnea Index AHI > 15/hour). When the cut off score is set at ≥ 3, the sensitivity to detect moderate to severe OSA is already high enough at 93%. However, the corresponding specificity is only modest at 43%. Dr. Chung, the author of the STOP-BANG questionnaire, had suggested the use of a modified scoring model to further improve the specificity in patients with intermediate score of 3 - 4. Instead of using a combination of any three positive items on the questionnaire, a specific combination of 2 items from STOP and any 1 item from BANG, e.g. STOP ≥ 2 plus BMI > 35 kg/m2 may increase the prediction of moderate to severe OSA. It may, therefore, aid the prioritization of polysomnography (PSG) among those patients who were classified as having an intermediate risk of OSA by the original STOP-BANG questionnaire with this two-step approach. This study aimed to evaluate the predictive performance of the modified scoring model of the STOP-BANG questionnaire to detect moderate to severe OSA in the local population.

Methods This was a retrospective single-centre study conducted in a regional hospital in Hong Kong. Clinical records of all suspected OSA patients who underwent in-patient Polysomnography (PSG) after assessments in our sleep clinic with a complete set of STOP-BANG data were retrieved for analysis. The predictive performance of the modified scoring model of the STOP-BANG questionnaire was evaluated.

Results Seven hundred and twenty-nine patients having in-patient PSG performed in the period between 1st January 2015 and 31st December 2019 were recruited for analysis. The sensitivity and specificity of STOP-BANG cutoff ≥ 3 to detect moderate to severe OSA were 97.6% and 13.5% respectively. When the specific combinations were applied to such group of patients with a STOP-BANG score of ≥ 3, the sensitivity and specificity were as follows: 23.6% and 90.4% in STOP ≥ 2 plus BMI ≥ 35kg/ m^2 **(S2B);** 56.2% and 77.3% in STOP ≥ 2 plus neck circumference > 40cm **(S2N);** 75.8% and 46.0% in STOP ≥ 2 plus male gender **(S2M);** 62.2% and 46.3% in STOP ≥ 2 plus age > 50 years **(S2A)**. In the subgroup of patients with a STOP-BANG score of 3 - 4, by applying the specific combinations, the specificities of **(S2B)** and **(S2N)** were improved at 97.6% and 95.8% respectively for moderate to severe OSA. In terms of probability, only **(S2N)** could significantly improve the probability to 66.7% for moderate to severe OSA, compared with the probability of 37.6% if only using STOP-BANG 3 - 4.

Conclusion This study showed a significant improvement in the probability for moderate to severe OSA by applying the specific combination of **(S2N)** only, but not **(S2B)**, **(S2M)** or **(S2A)**, in the patient group with an intermediate STOP-BANG score of 3 – 4 with the two-stepped modified scoring model. However, we cannot suggest incorporating this modified scoring model in routine clinical use due to the small patient number in this subgroup. We need further studies for the clinical application of the specific combinations and the development of better screening tools for patients with an intermediate risk.

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CARDIOVASCULAR RISK IN PATIENTS WITH SPONDYLOARTHRITIS

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Introduction Cardiovascular diseases (CVD) are the leading cause of death worldwide and patients with rheumatic diseases have an increased cardiovascular (CVS) risk including stroke

and myocardial infarction (MI). The evidence on CVS risk in spondyloarthritis (SpA) is relatively scanty compared with other rheumatic diseases. Delineating the CVS risk in patients with SpA and identifying modifiable risk factors would be useful.

Methods Patients with SpA and patients with non-specific back pain (NSBP) were identified in rheumatology and orthopedics clinics respectively. Clinical information and CVS events were retrieved. Incidence rates were calculated. Association analysis was performed to determine the CVS risk of SpA and other modifiable risk factors.

Results A total of 5046 patients (SpA 2616 and NSBP 2430) were included from eight centers. Over 56 484 person-years of follow-up, 160 strokes, 84 MI and 262 major adverse cardiovascular events (MACE) were identified. Hypercholesterolemia was more prevalent in SpA (SpA 34.2%, NSBP 28.7%, P<0.01). Crude incidence rates of stroke and MI were higher in SpA patients. SpA was associated with a higher risk of MACE (HR 1.66, 95%CI 1.22-2.27, P<0.01) and cerebrovascular events (HR 1.42, 95%CI 1.01-2.00, p=0.04). In patients with SpA, hypertension and ischemic heart disease were associated with a higher risk of MACE, while smoking, hypertension and chronic kidney disease were associated with cerebrovascular events. Biologics, especially anti-tumor necrosis factor, were associated with a protective effect on MACE (HR 0.37, 95%CI 0.17-0.80, P=0.01).

Conclusion SpA is an independent CVS risk factor. Biologics might have a protective effect on these patients.

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PREVALENCE OF MONOSODIUM URATE CRYSTAL DEPOSITION AND HYPERURICEMIA IN PATIENTS WITH PSORIATIC ARTHRITIS – EVALUATION WITH DUAL ENERGY COMPUTED TOMOGRAPHY (DECT)

Dr Ho Cheuk Man, Department of Medicine & Geriatrics, Tuen Mun Hospital (Jun 2020 Rheumatology Exit Assessment Exercise)

Background Psoriatic arthritis (PsA) is known to be associated with hyperuricemia, which may predispose patients to gouty arthritis. However, the exact prevalence of gout in PSA is unknown. The gold standard to diagnose gout is to demonstrate monosodium urate (MSU) crystals deposition. Dual energy computed tomography (DECT) is a non-invasive technique that enables MSU crystals to be demonstrated in tissues.

Objectives To investigate the prevalence of MSU deposition as assessed by DECT and hyperuricemia in patients with PsA. The secondary objectives were to explore the risk factors associated with hyperuricemia and MSU crystal depositions, and the effects of hyperuricemia and crystal deposits on the disease activity and joint erosion.

Method Consecutive patients who fulfilled the CASPAR criteria who attended the rheumatology clinics of Tuen Mun Hospital between 2018 Aug and Oct 2019 were recruited. Clinical parameters including disease modifying antirheumatic drug (DMARD) treatment were collected. Patients were assessed for psoriasis severity and activity of PsA. Serum urate level and inflammatory markers were checked. Hyperuricemia was defined as ≥360mmol/L in women and ≥420mmol/L in men. Plain radiographs of hands and feet were performed and scored for erosions by Van der Heijde modified Sharp score. DECT of hands and feet were performed for the presence of MSU crystals. DECT images were scored for erosions using a modified scoring system from OMERACT PSAMRIS system.

Results Eighty-nine patients completed the study, of which 41 were women and 48 were men. The mean age was 52.1 years old. The mean duration of PsA was 5.1 years. MSU crystals depositions were found in 4/89 (4.5%) PSA patients. Hyperuricemia was present in 27/89 participants (30.3%). In patients with MSU crystals deposition, trends of longer duration of PsA, higher Psoriasis Area and Severity Index (PASI) score and more joint erosions were found. No association was observed between MSU crystals deposition and serum urate level.

Hyperuricemia patients were found to have higher Body mass index (BMI) (28.4kg/m2 vs 25.5kg/m2, p=0.003) and larger waist circumference (96.3cm vs 87.7cm, p=0.000). No differences in arthritis activity or joint erosion were observed in patients with or without hyperuricemia.

Conclusions Gout and hyperuricemia were fairly common in PsA patient with prevalence of 4.5% and 30.3% respectively. A trend of higher PASI and erosions score was observed in patients with monosodium urate crystals depositions.

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CLINICAL MANIFESTATION AND OUTCOME OF AN INCEPTION COHORT OF IDIOPATHIC INFLAMMATORY MYOSITIS IN A SINGLE CENTRE

Dr Ng Chung Man Cheryl, Department of Medicine, Queen Elizabeth Hospital (Jun 2020 Rheumatology Exit Assessment Exercise)

Background Idiopathic inflammatory myopathies (IIM) is a spectrum of disease with various presentation, it also carries a significant burden of multi-organ morbidities and mortality.

Objectives This cohort aims to review the clinical manifestation, treatment and outcomes in IIM patients and the associated factors.

Methods An inception cohort of IIM patients was recruited (n=168) in Queen Elizabeth Hospital from 1st January 2013 till 30th June 2019. The following data were collected: patient demographics, clinical characteristics, treatment received, complications and mortality. The clinical profiles tabulated, and survival presented using Kaplan-Meier curves. Comparisons made across subgroups of IIM using chi-squared test for dichotomous variables, t-test for continuous variables. Multivariate analysis using logistic regression analysis performed to identify independent variables associated with different outcomes and log-rank test for those related to survival.

Result Interstitial lung disease (ILD) is common among patients with IIM with the presence of anti-MDA5 antibody (OR 27.3, 95% CI 6.58-113.13, p<0.001) and absence of Raynaud's phenomenon (OR 0.047 95% CI 0.003-0.763, p=0.032) associated with rapidly progressive course. Ferritin level of 2889pmol/L was identified as the cutoff for RPILD in ILD patients with a sensitivity of 0.7 and specificity of 0.81. Malignancy and infective complications were common among IIM patients. Older age of disease onset (>57 years old) (HR 7.35, 95% CI 2.60-20.78, p<0.001) and presence of anti-MDA5 antibody (HR 5.43, 95% CI 1.53-19.23, p<0.001) were associated with poorer survival. RPILD and infections were common causes of death.

Conclusion IIM carries significant mortality and morbidity. Infection and RPILD were important causes of death.

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CHARACTERISTICS AND FACTORS PREDICTING TUMOR NECROSIS FACTOR ALPHA INHIBITOR (TNFI) FAILURE IN PATIENTS WITH RHEUMATOID ARTHRITIS: A RETROSPECTIVE OBSERVATIONAL STUDY

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Objectives To determine the proportion of patients with rheumatoid arthritis (RA) refractory to Tumor necrosis factors alpha inhibitors (TNFi) and identify predicting factors associated with TNFi primary and secondary non-responders.

Methods This was a retrospective observational study conducted in Princess Margaret Hospital. All eligible patients with rheumatoid arthritis treated with TNFi (Etanercept, Adalimumab, Golimumab, Certolizumab or Infliximab) from 1st January 2004 to 31st August 2019 were recruited. Demographic data (age, gender, height, weight, smoking, drinking, co-morbidities), disease characteristics (disease duration, RF, ACCP, joint erosions on X-ray, tender joint count, swollen joint count, patient global assessment, early morning stiffness, DAS 28 score), previous and concurrent csDMARDs use were collected. Kaplan-Meier analysis was used to assess drug survival. Linear regression analysis was used to identify predicting factors associated with TNFi non-responders.

Results TNFi primary nonresponse and secondary nonresponse were found in 18.8% and 34.3% of 96 RA patients respectively. Multivariate logistic regression analysis showed that higher albumin level was associated with TNFi primary nonresponse (OR 1.31, 95% CI 1.028-1.675, p=0.029) while female gender (OR 8.98, 95% CI 1.02-79.06; p=0.048), history of more than three csDMARDs (OR 15.33, 95% CI 1.68-139.71; p=0.015) and higher baseline DAS 28-CRP (OR 7.68, 95% CI 2.47-23.93; p=<0.001) were associated with TNFi secondary nonresponse.

Conclusion Primary and secondary TNFi nonresponse are not uncommon in RA patients receiving TNFi. In this small cohort, higher albumin level was associated with primary nonresponse while female gender, history of more than three csDMARDs and higher baseline DAS 28-CRP were associated with secondary nonresponse.

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RISK ASSESSMENT AND PREVENTION OF THROMBOSIS IN SYSTEMIC LUPUS ERYTHEMATOSUS WITH ANTI-PHOSPHOLIPID ANTIBODIES

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Objective To validate the adjusted Global Anti-Phospholipid Syndrome Score (aGAPSS) and to identify risk or protective factors of thrombosis in Chinese systemic lupus erythematosus (SLE) patients.

Method SLE patients who were diagnosed before July 2009 with no history of thrombosis were prospectively followed until June 2019 for the occurrence of thromboembolic events. The aGAPSS was calculated and validated. The hazard ratio of different risk factors was assessed.

Result 220 cases were included in the study, 59 were anti-phospholipid antibodies (aPL) positive (aPL +ve group), 161 were aPL negative (aPL-ve group). After a mean follow-up of 119.3±11.6 months, 13 events (10 arterial, 3 venous) occurred in aPL positive group, while 9 events (8 arterial, 1 venous) occurred in aPL negative group (p=0.005). For the entire cohort, aPL +ve and aPL -ve groups, the 10 years cumulative incidence of overall thrombosis was 10%, 22%, 5.6%; arterial thrombosis was 8.2%, 16.5%, 5.0%; venous thrombosis 1.8%, 5.1%, 0.6%; respectively. The aGAPSS score of 4 was most predictive of thrombosis even after multivariate analysis (p= 0.000). The presence of aPL in particular aCL, hypertension and hyperlipidemia were the most significant risk factors for thrombosis (P value 0.006, 0.006, 0.000 and 0.035 respectively). The efficacies of aspirin and hydroxychloroquine in thrombosis prophylaxis were inconclusive.

Conclusion The role of aGAPSS in the prediction of thrombosis was validated in Chinese SLE patients. aPL, aCL, hypertension and hyperlipidemia were predictors for thrombosis. The

role of long-term aspirin and hydroxychloroquine in primary prophylaxis for thrombosis remain inconclusive.

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